

SUGAR PINE

A GENUINE WHITE PINE



ITS PROPERTIES
USES AND
GRADES

Compliments of
Weyerhaeuser Sales Company
First National Bank Building
Saint Paul, Minnesota



THE SUGAR PINE TREE was first discovered on October 26, 1826, by David Douglas, a Scotch botanical explorer, who named it *Pinus lambertiana* after an English friend by the name of Lambert. Douglas was first to make a botanical exploration of the Northwest portion of America and was sent by the Horticultural Society of London, and on the afternoon of April 7, 1825, landed at the mouth of the Columbia River in Oregon.

In August, 1825, Douglas was in camp on a branch of the Columbia River. His journal, records in these words the beginning of his search for the Sugar Pine. "In the tobacco pouches of the natives I found seeds of a remarkably large Pine, which they eat as nuts, and from whom I learned that it grows on the mountains to the South. No time was lost in ascertaining the existence of this truly grand tree, which I named *Pinus lambertiana*; but no perfect seeds could I find, and I returned to my rendezvous at Fort Vancouver." On Thursday, October 26, 1826, more than one year later, having arrived in California, he says:

"I quitted camp early in the morning, to survey the neighboring country. About an hour's walk from camp, I met an Indian. To make him understand what I wanted, with pencil made a rough sketch of the Cone and of the Sugar Pine Tree which I wanted to obtain, and drew his attention to it, when he instantly pointed to the hills fifteen or twenty miles distant towards the South. At mid-day I reached the wished-for Pines, and lost no time in examining them and endeavoring to collect specimens of the seeds. One beautiful and immensely grand tree that had been blown down, had a circumference of 37 feet 9 inches at three feet from the ground; at one hundred and thirty-four feet, it was 17 feet 5 inches in circumference and the extreme length was 215 feet. The trunks are uncommonly straight, and the bark remarkably smooth, for such large trees, the branches drooping with cones hanging from their points like sugar loaves in a grocer's shop. The growing trees, which have been burned by the natives to save the trouble of felling them or of collecting other fuel, produce a quantity of sugar-like substance, sweet to the taste.

"A little before this time of year the Indians gather the cones and roast them on the embers, then quarter them and shake out the seeds, which are afterwards thoroughly dried and pounded into a sort of flour, or else eaten whole."



Extracts from the Original Diary of David Douglas in Possession of Royal Horticultural Society.



Portrait by Courtesy of Royal Horticultural Society, London, England.



"Noble as are its associates, the SUGAR PINE is easily king, and spreads his arms above them in blessing while they rock and wave in sign of recognition."—JOHN MUIR.

FOREWORD



HIS is a remarkable age, an age that finds available materials and commodities in number and variety unheard of in the past. Such abundance and diversification of products have been made possible in no small measure through national advertising, sales promotion and highly organized distribution methods. The buying public is deluged with the claims of competing products. As a result, the consumer today finds it more difficult than ever before to select with assurance the product most suitable for his particular need.

Actual utility for a specific use should be the yardstick by which a product is judged. This booklet has been prepared with that principle in mind. The facts about SUGAR PINE and the requirements essential for

specific uses are presented in convenient form. With these available, the consumer may draw sound conclusions.

Reliable sources of information have been utilized in the preparation of this publication, including authoritative data supplied by federal and state governmental agencies. An important source also is the Research Laboratory of the Western Pine Association. The establishment of this laboratory in 1925 was a unique departure in lumber trade association effort. It is the pioneer undertaking of its kind in the lumber industry. It has long since proved its value and has given both the manufacturer and user of SUGAR PINE a very definite advantage through a consistent program of research which has for its object the improvement of the manufacture and use of these products.

WESTERN PINE ASSOCIATION

YEON BUILDING



PORTLAND, OREGON

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The History of Pine

Prior to the signing of the Declaration of Independence, the great state of Massachusetts selected the Pine Tree as the emblem for its state flag, partly perhaps, because White Pine had played so important a part in providing material for the shelters of colonists in that state.

As new settlements sprang up elsewhere, White Pine lumber likewise was sure to be found, in greater or less degree, in the buildings that were erected. Now, more than three hundred years since the landing of the Pilgrims, countless New England homes built largely of White Pine stand, as if imperishable, in mute testimony

to the wisdom of those early settlers. On the Pacific Coast, the history of true White Pine has repeated itself, for old homes of many Western pioneers who built with this wood (SUGAR PINE in California) still stand, an eloquent tribute not only to their workmanship but also to the material of which they were constructed.

Little wonder it is then that White Pine has always been accorded a preference among building materials or that American citizens of the present generation are pleased that White Pine continues in abundant supply, readily available for the homes they build.

Botanical Classification and Commercial Name

Pine trees are often referred to as soft pines or hard pines, white pines or yellow pines. These terms, in the first instance, are based on the appearance and texture of the wood and, in the second group, are so classified botanically by reason of the formation of the needles, cones and bark or similar characteristics common to trees of the group.

SUGAR PINE¹ (*Pinus lambertiana*) is both a soft pine and a white pine. So also are Northern White Pine (*Pinus strobus*) and Idaho White Pine (*Pinus monticola*). *Pinus strobus* is found in the Eastern and Lake states; the other two genuine White Pines grow in the West. A third western species of the soft pine group, though not a white pine, is Ponderosa Pine (*Pinus ponderosa*).

¹ Also known as "Genuine White Pine".

SUGAR PINE has five slender needles in each cluster or sheaf, a characteristic which is common in other commercial true White Pines and has caused these woods to be known as "five-needle" pines. Moreover, in SUGAR PINE, the clusters occur in feathery tufts along graceful branches, often pendant tipped with cones, that reach horizontally far out from the tree trunk, as do those of its eastern relative, the White Pine of the New England and Lake States.

The wood of each of the three genuine White Pines is so similar that, as stated in the U. S. Forest Products Laboratory Technical Note No. 215, "There is no absolutely positive means of identifying the three white pines one from another microscopically." SUGAR PINE is used freely for all White Pine uses, because both botanically and physically it is White Pine.



A mature forest of Sugar Pines and associated species, ripe for cutting, and (on the left) a clump of young Sugar Pines.

Sugar Pine Forests

SUGAR PINE grows chiefly in the Sierra Nevada ("Snowy Range") of California, at elevations of from 3,000 to 7,000 feet. Scattered tracts also are found in southern Oregon. The largest trees and heaviest stands are found on the west slopes of the Sierra in California. Rain, snow, sunlight and warmth, combined in favorable proportions, contribute greatly to this development. The trees grow on ancient glacial moraines, which everywhere abound, and stand more or less apart as in small irregular groups. In the larger openings between the big trees, are on-coming forest crops of younger trees. No other pine forests ever grew under such favorable soil and climatic conditions, and the trees are not only extremely large, but produce lumber

of excellent, mellowed texture and very generous dimensions.

SUGAR PINE is a monarch among trees, the largest of all the pines. Its tall, straight and nearly cylindrical trunk is covered with a rich purple or cinnamon brown bark, rather deeply furrowed, and often the trunk is free of limbs for seventy-five or eighty feet above the ground. Occasional specimens reach a height of about 250 feet, and a diameter of 12 feet; more often though their diameter will measure from 4 to 7 feet. The foliage of SUGAR PINE is a deep blue-green with a whitish tinge. The cones are huge, roughly 16 inches long, and hang from the extreme tips of the upper branches like ornaments on a Christmas tree.

Timber Supply and Lumber Production of Sugar Pine



It is from large boled Sugar Pine trees like these that the wide and thick Select lumber is cut.

Government and private estimates indicate the timber reserves of SUGAR PINE now total thirty-five billion feet. Young growth and added increment in the older trees will increase the estimate appreciably. Although used extensively ever since the famous California "gold rush" days, the annual production of SUGAR PINE approximates three hundred million board feet during normal periods of business. There is every assurance of an ample quantity of this valuable lumber for many generations to come, probably forever. Any statements which purport to show that the supply of genuine white pine is practically exhausted cannot be substantiated in the light of these facts.

The Manufacture of Sugar Pine

The inherent quality of SUGAR PINE has always justified the high standards employed in its manufacture. For many years this lumber, and the species with which it is associated, have occupied an enviable position in lumber markets because of the close attention given to seasoning, milling and grading of these products. Particularly is this true of SUGAR PINE. The mills are equipped with modern machinery, and the methods employed throughout the entire manufacture of SUGAR PINE are to the end that this wood will be furnished in a condition which is in keeping with its high quality.



Careful manufacture to preserve and enhance the natural high quality of Sugar Pine is a regular practice at the sawmills which cut this wood.

Milling

The natural soft, even texture and uniformly straight grain of SUGAR PINE permits unexcelled millwork and this lumber, after dressing, has a smooth, satiny surface. It is worked to standard sizes and patterns *after* seasoning, or, in other words, after the shrinkage which is normal in drying has taken place. SUGAR PINE is an exceptionally well manufactured product and shipments are uniform in this respect.

Seasoning

SUGAR PINE is seasoned without difficulty. It is dried successfully in the kiln and in the yard. Practically all plants kiln dry at least a portion of their cut. The climatic conditions of the region favor effective air seasoning.

The manufacturers of SUGAR PINE have kept pace with all developments tending to improve seasoning practice, and have always recognized the importance of furnishing lumber that is suitable to the needs of the consumer. However, as a group they have felt that the time has not yet arrived when it is advisable to

formulate moisture content specifications. Until more information is at hand as to the moisture requirements of various items when placed in use, and until means can be devised for accurately and quickly determining the moisture content of a board, such specifications could only set up great hopes but in reality could assure nothing of practical value to the user; consequently, such specifications have not yet been adopted.

On the other hand, the mills, through their regional organization—the Western Pine Association—are the only ones in the entire lumber industry to establish and maintain a lumber seasoning department with personnel especially trained in this work. This action furnishes evidence of their convictions as to the desirability of offering the buyer a ready source of supply of dependably dry lumber. SUGAR PINE as actually shipped ranks exceedingly high, compared with other woods, in its condition of seasoning, and no lumber goes to the consumer in better condition for immediate use.

Grading

SUGAR PINE is graded under the rules of the Western Pine Association, which for more than a quarter of a century has been the recognized authority on the grading of this wood. Its Bureau of Grades is composed of highly trained inspectors, who check the work of the plant graders at member mills each month, assuring to the users of SUGAR PINE closely graded shipments from every mill. In the event of a dispute over a shipment, the services of the Bureau of Grades are available for reinspection when requested either by the shipper or the purchaser.

Concise, informally written descriptions of SUGAR PINE grades are presented in another part of this booklet. Each grade is illustrated by actual photographs of representative pieces. From these one can familiarize himself with the grades of SUGAR PINE.



Sugar Pine trees, due to their huge size and comparative freedom from side branches, yield a high percentage of clear lumber, which the sawyer at the mill secures by skillfully cutting each log.



For many generations genuine White Pine has been considered the premier of woods for window and door frames.

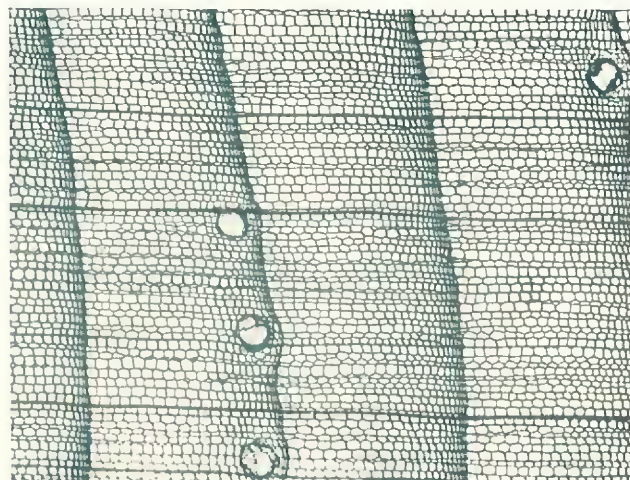
Identified Lumber



This mark, which is registered in the U. S. Patent Office, is the seal of the Western Pine Association and reserved for use by its members and the Association staff.  is the distinctive species mark. These marks are imprinted on SUGAR PINE to permit easy identification of lumber manufactured under Association inspection and according to its high standards of seasoning, milling and grading. Such uniformity of products from widely separated

mills can be maintained only through the constant supervision which the member mills receive from the Bureau of Grades.

Wherever a buyer desires his material marked as to grade this will be done upon request by any of the Association mills manufacturing SUGAR PINE. Another means of protection offered by these mills is a "Shipper's Certificate of Car Contents" forwarded in the car as a form of manifest to certify by species, grades and sizes the amounts and exact description of items loaded by the manufacturer.



Photomicrograph of cross section of Sugar Pine showing its uniformly thin-walled cellular structure. Even under a microscope, the wood's characteristics positively identify Sugar Pine as a genuine White Pine.

Characteristics and Properties of Sugar Pine

Appearance

The wood of SUGAR PINE is a beautiful, soft-toned creamy white, which darkens to a pale brown sometimes tinged with pink, as it ages. Although usually a fairly rapid grower, its grain shows scarcely at all. The indefiniteness of the figure produces a pleasing effect when the wood is stained or finished natural. Small ducts running lengthwise with the grain are quite common, and knots in SUGAR PINE characteristically show a dark purplish brown band around their edges.

Wood Structure

The uniformly soft, thin-celled structure of both the spring wood and summer wood of SUGAR PINE, as well as its straight grain, in no small measure accounts for the ease with which it is cut parallel to or across the grain, and for its lustrous finish when milled or worked by hand. Though soft in texture there is cohesion of the cells which makes the wood firm yet yielding, in contrast with some building materials which are soft to the extent of being pithy or brittle.

To those who are familiar with trees of the North Woods, it can be said that SUGAR PINE is very similar in grain and texture to the old Michigan Cork Pine, to which it is related.

Other Characteristics

The wood has little odor or taste. It is comparatively free from pitch, pitch pockets and heart shake. Due to its large size SUGAR PINE produces wider pieces of thick Clear lumber than does any other pine.

Workability with Machine and Hand Tools

The splendid working properties of the white pines is axiomatic in the woodworking field. SUGAR PINE is no exception. Its lumber is cork like and pliable in texture and works easily. It machines smoothly to any pattern however intricate it may be or precise the requirements of the finished form. And whether in the hands of a carpenter with his saw and plane, a school boy fashioning out his first boat, or a skilled pattern maker with mallet and chisel, SUGAR PINE performs

perfectly for the skilled and unskilled alike and with less labor, because SUGAR PINE meets the most exacting demands of woodworkers everywhere and when shaped by the craftsman virtually guarantees fidelity of design.

Shrinkage

All wood shrinks as it dries and swells as it absorbs moisture. The heavier woods shrink and swell more than do the lighter woods with any given change in moisture content. Obviously this factor becomes of major importance in the selection of a wood for the many uses where a minimum change of dimensions is essential as, for example,—sash, foundry patterns and piano keys. The large volume of SUGAR PINE that annually goes into such uses is evidence of its low rate of shrinkage and swelling which the woodworker knows from experience is true and which tests in the laboratory have confirmed.



Dry kilns, scientifically controlled and operated, season Sugar Pine lumber rapidly and effectively.

Ability to Stay in Place

SUGAR PINE woodwork holds its shape. For most uses this is an important characteristic. It is essential in the pattern trade, where SUGAR PINE is marketed in ever increasing quantities, for the pattern maker must be certain that after he has completed his pattern, no part of it will shrink, warp or twist, as his finely carved pattern is finished with exactness, and the material with which he has worked must absolutely "stay put" or his mould is valueless and the pattern must be discarded. The careful seasoning and natural qualities possessed by SUGAR PINE in this respect enable it to meet the most exacting requirements, or to quote from a statement by government authorities—"SUGAR PINE ranks with the best."



A truckload of typical Sugar Pine logs.

Discolorations

SUGAR PINE is free from objectionable coloring matter which, in some woods, combines with paints and enamels in such a way as to discolor them. In common though with all of the pines and other species, it is subject to blue stain during air seasoning. Through experience and test, methods have been devised which minimize this problem. The freshly cut logs are put through the mill and into pile as quickly as possible. Great care is given to the air drying yards and lumber piles to insure adequate ventilation without too rapid drying. Fortunately, the region where SUGAR PINE mills are located has very favorable atmospheric conditions for drying lumber in the open air. It is common practice also for the mills to be equipped with modern dry kilns with which to season stock under controlled conditions.

Blue stain, of course, has no weakening effect on the strength properties of wood, nor is it an early stage of decay. It is caused by minute, non-wood destroying fungi which grow in the cell cavities of sapwood. The bluish color is a blending of the colors of the wood and of the fungus threads within the wood. It is objectionable therefore only as it impairs the appearance of a board. Blue stained lumber while not recommended for natural finish work has many uses for which it is suitable; painted woodwork is one of them.

Ease of Drying

SUGAR PINE is easily dried and because of its structure and the use requirements is always dried before surfacing and shipping. No other wood reaches the consumer in better condition for use.



Felling Sugar Pine trees requires a great amount of experience and skill, because of their immense size.



The thick stock in Sugar Pine, such as is used in making foundry patterns, is end coated and sheltered from the sun in low piles, to prevent too rapid or uneven drying.

Weight

The specific gravity of SUGAR PINE is .33 as compared to an average of .35 for all the white pines. At a moisture content of 12% the mean weight of SUGAR PINE is $23\frac{1}{2}$ pounds per cubic foot while the average of the white pines is 26 pounds. These figures are to be compared with 41 pounds for longleaf yellow pines, 34 pounds for coast type Douglas Fir, and 30 pounds for redwood. Truly SUGAR PINE is a light weight wood, and this fact may well be considered when the labor of handling is involved, whether it be in moving the raw material or finished articles.

Strength

The soft textured pines and other woods of relatively low specific gravity do not have strength values as high as those of the harder, denser woods such as southern yellow pines, larch or Douglas fir. For most purposes where SUGAR PINE is used great strength is not a factor of importance. It is interesting, however, to note that SUGAR PINE is strong for its weight and able to easily withstand the strains to which it is put in use without at the same time causing unnecessary added weight.

A comparison of the important strength properties is given below by means of index numbers which indicate the relative position of several species:

	SUGAR PINE	WHITE PINES AVERAGED	RED- WOOD	COAST DOUGLAS FIR
Bending (as a beam)....	64	65	90	90
Compressive (as a post)...	68	70	104	107
Stiffness.....	112	119	134	181
Hardness.....	38	36	59	59
Shock Resistance.....	55	58	70	81

Conclusive comparative strength tests show good kiln drying and good air drying have the same beneficial effect upon the strength of wood.

Resistance to Splitting

Because of its straight grain, SUGAR PINE at one time was rived extensively into shakes for miners' cabins but this fact should not be confused with the tendency of a wood to split either in nailing or in drying. Quite to the contrary, SUGAR PINE like others of the soft pines has remarkable ability to resist splitting when nailed. As a rule, the higher the density of a wood the greater is its tendency to split and splinter, which rule further substantiates the previous statement. Checks or splits in the stock after shipment are rare because SUGAR PINE is sent from the mills in a well seasoned condition.

Nail and Screw Holding Ability

The higher the specific gravity of a wood, the greater the resistance it offers to the withdrawal of nails, yet nail holding ability involves more than this. Since SUGAR PINE is easily nailed without splitting, proportionately larger nails may be used in this wood with the advantage of greater resistance to the withdrawal of the nails than is the case when using lighter nails in denser woods.

The absence of hard grain in SUGAR PINE eliminates any likelihood of nail deflection or the need to drill holes for the nails.

The degree of dryness of the wood when nailed has direct influence on the power to resist withdrawal of nails for as a green stick which has been nailed dries out the wood fibers shrink away from the nail and when dry they offer little resistance to the removal of the nail. SUGAR PINE is thoroughly dried before it is shipped and the condition which has just been described therefore is not experienced by users of this wood.

A good test of the toughness and cohesion of wood fibers in different kinds of woods is to be had by driving, removing and later replacing a screw in the wood ad-

joining the first screw hole. Woods that are brash cannot successfully stand up under such a test, and in such instances the wood fibers separate, break and the area loses its screw holding power. SUGAR PINE is an excellent example of the opposite type of wood. The fibers are strong, tough and appear to have a waxy impregnation which permits the fibers to yield without breaking, and the wood structure to remain intact. This property, quite naturally, is of added value in the use of SUGAR PINE for some purposes.

Ease of Gluing

SUGAR PINE is an outstanding wood for glued-up work. Its worth in this respect has been proven many times over in such items as foundry patterns, piano keys, drawing boards, doors and cabinet work.

Ease of Painting and Finishing

The ability of a wood to take and hold protective coatings is an important factor in its use. Seldom is a wood left unpainted or unfinished under modern standards of living. In the case of exterior uses proper painting improves the appearance. But of even greater importance, it retards the absorption of moisture and thus minimizes weathering, change of dimensions, and liability of decay. Freedom from change in dimensions is quite essential where moving parts are involved, as for example, in sash and doors. A satisfactory finishing of interior woodwork is required to obtain desired decorative effects and to permit easy cleaning without possible damage to the material.

Paint failure on wood can result from a variety of causes. Cheap paints, improper application of good paints, or faulty construction of the woodwork may be directly responsible.

Faulty construction causes paint failures when it allows the entrance of water back of the paint film. In

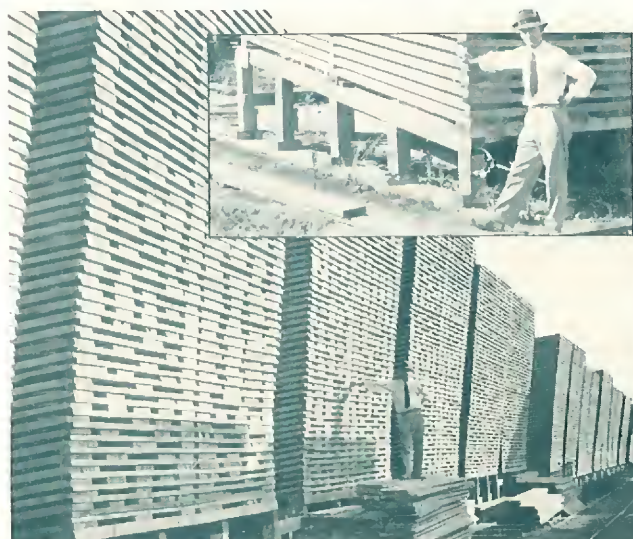
so doing, the moisture content of the material is raised. When excessive moisture is present it is almost sure to be accompanied by blistering and peeling of paint.

Practices which can bring about this difficulty, and which therefore should be condemned, are:

1. Poorly installed flashings or entire lack of metal flashing around window and door openings, at junctions of dormers and roof, or of porch and sidewall.
2. Careless fitting of siding against trim at windows and doors, and at corners.
3. Poor joining of siding, trim, cornice and porch work, also poor joining of window sill and jamb.
4. Lack of provision for ventilation under porch steps, and porch columns and parts near the ground.
5. Placing untreated woodwork in contact with earth where it can readily absorb moisture.
6. Applying siding over rain-soaked or ice-covered sheathing.
7. Exposure of finishing lumber, window frames, doors and sash to storms or wet plaster.
8. Painting woodwork that has been rained upon, before it has dried out.
9. Poorly seasoned lumber.
10. Failure to seal with aluminum or white lead paint all joints that are known to be most subject to decay.

Grain raising and similar action in woods of high shrinkage not uncommonly crack the paint film. The presence of pronounced pitch, gum, and natural oils in woods is apt to cause discolorations and other difficulties. In general the soft, even-textured woods take and retain paint better than the harder, denser woods.

Paints, shellac, lacquers and enamels are provided with an excellent base when applied on SUGAR PINE.



Sugar Pine is piled carefully in the air seasoning yards of sawmills so that the proper circulation of air around each board is secured.



Sugar Pine is outstanding because of its incomparable ability to produce large quantities of extra-wide, soft-textured lumber in all thicknesses.



Examples of wide clear pieces obtainable in Sugar Pine for special uses.

The uniform texture of the wood results in even absorption of paint, thus giving the priming coat good anchorage. The grain shows no tendency to raise; changes in dimensions under varying atmospheric conditions are exceedingly slight; and the wood's clear white color offers no resistance whatsoever to the use of light tints of paint and enamel. Besides, painters testify that paint flows evenly and smoothly over the wood's glossy surface.

SUGAR PINE is also well adapted to natural and stained finish, because of its uniform color, its beautiful subdued grain, and its even absorption of stains and shellac or varnish. There is increasing depth and softness to the finish of stained SUGAR PINE as it mellows with age.

Penetrability of Preservatives

SUGAR PINE, because of its thin-walled and even-celled structure, permits the maximum depth and uniformity of penetration of preservatives and fire-retardant compounds with the usual methods of treatment. Lumber so treated will give better service than when the penetration is superficial or spotty.

Permanence

With continued use all materials are subject to physical depreciation either to a greater or less extent. However, selection of building materials should not be based solely on this factor, for with reasonable care and maintenance lumber, and also other materials, will endure far beyond the life or usefulness of the average well constructed building. Convincing proof of this is to be found in every community where residences and office

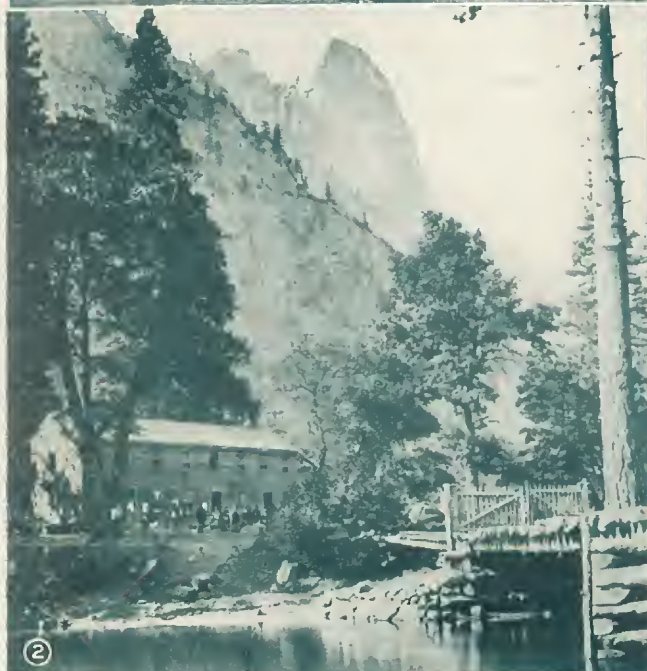
buildings alike are torn down to be replaced by new and more modern structures while the materials from which they were built are still in good condition. Obsolescence of a building, then, usually determines the permanence of the materials and it may be traced to one of the following conditions:

1. Progressive neighborhood decline in older residential sections.
2. Higher standards of living.
3. Development of new residential districts.
4. New styles of architecture.
5. Changed use and occupancy on account of increased urban population.
6. Increased land values.

On the other hand, if the merits of genuine White Pines, and SUGAR PINE in particular, are to be judged on their performance in buildings, certain facts should be cited to make the record complete. The earliest installations of White Pine are in New England, as for example, The Fairbanks House at Dedham, Massachusetts, was built in 1636. Many others like it, built in the 18th century, still stand and are occupied after all these years. On the Pacific Coast, SUGAR PINE was the choice of the 49'ers, drawn in to California by the lure of gold, for the construction of their crude cabins in the Sierra foothills and higher ground. Years have passed since then. Rain, sun and heavy snows, in their turn, have struck with vengeance at these shelters of SUGAR PINE but many there are in the hills today, some occupied, others abandoned, facing the weather as it comes, yet still sound and serviceable.



Many deep winter snows have tested the serviceability of the Sugar Pine used in this building in the Sierra Nevada of California.



Pioneer Sugar Pine Buildings in California—(1) Nichols cabin at Fresno Flat; (2) Hutchings Hotel in the Yosemite Valley as it appeared in the 60's; and (3) the same building, as "Cedar Cottage", after 67 years of continuous use; (4) Mammoth Trees Hotel at Calaveras Grove (from a sketch made about 1856); and (5) as photographed 70 years later, the original building still in excellent condition; (6) a picturesque old cabin standing beside the "Big Oak Flat" road into Yosemite, said to have been the home of Bret Harte's character, "Tennessee Partner".

The Nichols cabin at Fresno Flat, California, when last examined had given seventy years of useful service. Cedar Cottage, first known as Hutchings Hotel when

it was built in 1859 in the Yosemite Valley of California, is another "landmark" attesting the lasting qualities of SUGAR PINE. At Calaveras Grove, California, the SUGAR PINE in the Mammoth Trees Hotel has faithfully withstood the elements since 1853. Then there is the Gould Cabin, built at Chester Flat in 1868, which had its roof covered with SUGAR PINE shakes; when dismantled 67 years later, the material was still sound and weather resisting. These experiences with SUGAR PINE when put to exterior use are being duplicated everywhere, since its introduction in national markets fifty years or



Another pioneer structure, the Olesen cabin, built of Sugar Pine in 1868 at Chester, California, in the high Sierra. Never painted or given any preservative treatment. Cabin sixty-five years old when photographed.

more ago. The voluntary expressions of some users are given on another page in this booklet.

The inherent lasting properties of any wood may be modified of course, through construction methods employed which, in turn, depend upon the workmanship in the building. Were this not so, less attention would be given to the construction of buildings that are planned for longer than average use.

Weathering, one factor which may cause deterioration, is due primarily to unequal shrinking and swelling of wood following periodic changes of moisture content. The surface layers of a board, if exposed to rain and sunshine, or to constantly varying humidity conditions of the atmosphere, alternately absorb or lose moisture rapidly. This action causes a very slow breaking down or separation of the surface fibers and in some woods results in marked raising of the grain, checking, cracking, and splitting. Such changes are especially noticeable on exposed woodwork that has never been painted. It is of importance in such uses as siding, sash, window frames, porch and cornice woodwork, and other exterior trim. Weathering may be avoided by selecting a wood like SUGAR PINE whose properties naturally resist deterioration from this cause. An additional advantage is its ability to take and hold paint, for a good paint coating will prevent weathering by retarding the absorption of water to such an extent that large inequalities of moisture within the lumber are avoided.

Decay of wood, the second factor which may cause deterioration, has sometimes been considered of more importance than its infrequent occurrence warrants. In fact, to some extent its overemphasis has obscured the satisfactory service record of wood during many generations in America. This physical condition, like weathering, is preventable if the causes of decay are known. Decay is a breaking down of the wood structure due to the action of tiny living organisms called fungi. Four things are necessary for their continued growth: (1) sufficient moisture, (2) sufficient air, (3) favorable temperatures, and (4) abundant food supply.

Absence of air prevents the development of decay in wood that is completely saturated, as when it is submerged in water or deeply buried in the ground. Likewise, wood that remains dry does not decay. So, by controlling a single factor decay can be prevented. Of the four, the one most practical to control is moisture. Maintenance of a moisture content below 25% is sufficient to bring about this result. As has been explained in the discussion of weathering, tight joints and other good construction practices, together with a good protective coating of paint, which greatly retards the absorption of water, are simple yet effective means of overcoming decay. As most buildings are repainted at fairly regular intervals to improve their appearance, reasonable protection is usually maintained. At these times, though, care should be taken to cover thoroughly with paint the locations that are most susceptible to decay. From the standpoint of economy SUGAR PINE is especially recommended because of the ease with which this variety of wood absorbs and retains paint.

The great bulk of the wood in use is kept so dry at all times that it lasts indefinitely. On the other hand, wood in contact with the soil, as when resting upon or partly buried in the ground, is likely to decay. Thus decay must be guarded against in fence posts, railroad cross ties, mine timbers, mud sills, and in other similar items. Ordinarily only treated wood should be used for such purposes. In practically all other places, except perhaps under extreme conditions as may be found in dye plants or in paper and textile mills where high humidities and excessive condensation are constantly present, decay resistance is not a factor of importance in the selection of suitable materials.

Several years ago there was distributed a table² which attempted a rough classification of the decay resistance of woods for uses involving actual contact with the soil. It was based on service records of timbers (principally poles, posts, ties, and mine timbers) placed in contact with the soil, and on personal observations. The table indicated that even under such unfavorable conditions, where now practically all wood is treated if long service is expected, the wide variety of climatic, soil, and moisture conditions to which timbers might be exposed as well as the great difference between individual timbers of the same species precluded exact comparisons. The immediate misuse to which this table was put caused its prompt withdrawal from further circulation. Unfortunately this has not prevented its continued misuse, with the result that inestimable harm has unjustly been done to wood generally.

From the preceding discussion of the factors influencing decay, also the vast number of uses for wood, and particularly the almost limitless variations in the conditions surrounding these uses, it is obvious that

²Technical Note 173, U. S. Forest Products Laboratory.



woods cannot be accurately rated as to their relative decay resistance under all conditions. The liability of decay to develop in wood will vary through the entire range of conditions from actual contact with the soil in a warm, humid climate to the top of a desk in a well ventilated and heated office building. In the first instance, *any* wood if not given a preservative treatment will decay. In the latter case, *no* wood will decay. In many common uses, under certain conditions *any* wood will decay in a few years because of faulty construction or inadequate maintenance. This is no discredit to wood which, if given fair treatment, will last for the life of the building.

Most of the pines, including SUGAR PINE, are given an intermediate rank as to decay resistance in contact with the soil. In common with all woods it should ordinarily be given preservative treatment when placed in such locations. For all recommended uses, SUGAR PINE will not deteriorate because of decay if sound principles of construction and reasonable maintenance standards are adhered to.

Insulation

Among building materials of the rigid type, the high insulating value of wood is without parallel. This quality of wood has long been known and utilized.

In general, the relative efficiency of different woods as insulators against heat or cold varies inversely as the specific gravity. Because of its low density, the thermal conductivity of SUGAR PINE is extremely low and its insulating value exceeds that of most woods. This property gives added value in such items as sheathing, roof boards, sash, doors, and siding, where SUGAR PINE is widely used.

Adaptability

An important consideration in the selection of a wood is its adaptability to a given use. The determining factor in most instances is the high rank, relatively, of each of the wood's essential properties rather than a high value in one and low values in its other properties.



Large, dry lumber storage shed at Sugar Pine sawmill.

SUGAR PINE is conspicuously a wood with a high average property rating and therefore exceedingly well adapted for many uses. Its values are recognized most of all in the trades where the wood requirements are most exacting, as for example in pattern making.

Economy in Use

The cost of the raw material is only one factor that must be reckoned with when dealing with the subject of economy in use, and in some cases it is a very minor one. For instance, let us consider pattern making. Here, labor is the most important item of expense; the cost of the wood out of which the pattern is made is insignificant in comparison. In the same way, labor costs in the woodworking shop and factory, frequency of tool maintenance, and waste through mismanufacture are all affected by the wood selected for use and have a direct bearing on production costs. SUGAR PINE is not the lowest cost wood in use today, neither is it the highest and for many uses, the valuable properties possessed by SUGAR PINE fully justify its use in preference to other kinds, by persons who would build well and with thought to low ultimate cost in service.

Before purchasing any building material it is always the safest plan to determine the important requirements of the intended use and then judge between available materials on the basis of this yardstick. Such procedure will result in greatest satisfaction when selecting the kind of wood for lumber and woodwork items, for after all, utility of the material is essential for good performance at low cost.



Research Laboratory of the Western Pine Association which is working constantly to improve the quality and serviceability of Sugar Pine.

Letters From Satisfied Users of Sugar Pine

1. *Los Angeles Biltmore Hotel*

Four years after installation of SUGAR PINE sash and window frames in this building, manager Charles Baad wrote:

"We have had no difficulties nor complaints in regard to warping and swelling, and the window sash run as freely today as when they were first fitted."

2. *Office Building of Detroit Lumber Co., Detroit, Michigan*

This concern, in sending a photograph of its office building which was built in 1914, stated:

"All the doors and windows are manufactured out of Sugar Pine, have been in service for 21 years, and are as good as the day they were installed. We find Sugar Pine, for frames and sash, the best species of lumber and can unhesitatingly recommend it to anyone."

3. *Monadnock Building, San Francisco, California*

This building, erected in 1906, has SUGAR PINE windows and window frames throughout. The manager, Mr. Earl Pooler in 1935, said:

"We are pleased to send you a photograph of the Monadnock Building, and in response to your request, state our opinion of the SUGAR PINE windows and frames used throughout this building.

"After thirty years' service, the windows which are exceptionally wide, and glazed with heavy plate glass, show no signs of deterioration. They have always worked perfectly, and we have had no expense for repairs."

4. *Four Manual Pipe Organ for First Methodist Church, South, of Dallas, Texas*

The builders—Henry Pilchard's Sons, Inc., of Louisville, Ky.—made this statement in forwarding a photo-

graph of the organ, taken in 1926 on their assembling room floor:

"We erect all of our organs right in the factory and test everything completely before shipping. Every piece of natural finish wood shown in this photograph is California Sugar Pine."

5. *Providence County Court House, Providence, Rhode Island*

A letter received from L. Vaughn Co., Providence, Rhode Island, about the installation reads:

"... we used California Sugar Pine for some of the interior finish and for some of the exterior sash at the new Providence County Court House with very satisfactory results. The outstanding example of this work is in Court Room No. 9. The four walls of this room are paneled from floor to ceiling, and it required a considerable amount of elaborate carving. We found the Sugar Pine to be a wood that was very well suited for this class of mill-work, especially for the carving. This building has been occupied for the last three years and the woodwork is still in perfect condition and gives every evidence of remaining so indefinitely. We do not hesitate to recommend this lumber for interior work of this kind, or for exterior use in sash or doors."

6. *Palace Hotel, San Francisco, California*

Regarding the wood windows in the Palace Hotel, Archibald H. Price, Manager, has written in 1935 as follows:

"We have examined our records and find that SUGAR PINE was used throughout the entire structure for this purpose on the recommendation of Trowbridge and Livingston, the architects.

"The hotel was completed in 1909 and we are pleased to say that the original sash are still in use and giving excellent service."

Installations of Sugar Pine and Specific Use Requirements

Each example illustrated on the pages that follow shows actual application of Sugar Pine to some use. The installations are typical of the kind in which this wood is giving satisfactory service.

Doors

A door, to fulfill the purposes for which it is intended, must operate freely, fit snugly, and definitely contribute beauty to the room, or to the entrance, in the case of exterior doors. Only through a combination of good design, excellent workmanship, and a satisfactory wood can such results be expected. A wood that is light in weight, yet strong, increases the chances of a door operating easily, and also causes less strain on the hinges. In large doors the matter of weight is especially important. Woods of soft, even texture and freedom from tendencies to split and sliver, are more easily cut and shaped to pattern, and can be dressed smoothly, thus providing a good surface for subsequent painting. The effectiveness of a paint coating is improved when the paint is applied to a wood which absorbs the priming

coat evenly and economically. Expansion and contraction of a wood, in relatively large amounts, lower the resistance of a door to weathering, and are of importance especially when considering selection of exterior doors, but changes of dimensions also may cause interior doors to stick or fit poorly. Woods of low shrinkage prevent occurrence of this trouble. Because of the large use of veneered doors, as well as of solid doors made up of many parts, a wood for door construction should have good gluing properties. It should also take screws without splitting.

A wood suitable for door construction should—

1. Work easily.
2. Expand and contract only slightly.
3. Be light in weight, yet strong.
4. Glue easily.
5. Take and hold paint and other finishes.
6. Take screws without splitting or badly tearing the wood fibers.
7. Resist weathering.



SUGAR PINE DOORS—(1) Baltimore, Md., residence, screen door, entrance door and trim, William Gordon Beecher, Arch.; (2) Muncie, Ind., apartment entrance door of Colonial design, Herbert F. Smenner, Arch.; (3) Santa Monica, Calif., residence, Wm. J. Gage, Arch.; (4) French doors; (5) Entrance and screen doors in a home in California; (6) Baltimore, Md., residence, entrance doors, shutters and trim, Palmer and Landin, Arch.; (7) Same as (2); (8) Garage Doors, Bachelor Officers' Quarters; and (9) 12 ft. doors, Lumber Storage Building, U. S. Naval Air Base, Moffett Field Sunnyvale, Calif.; (10) Oakland, Calif., residence front door, Harris Allen, Arch.



C O M M E R C I A L



SUGAR PINE WINDOWS—(upper left) **San Francisco, Calif.**, Russ Building, Geo. W. Kelham, Arch.; (upper right) **San Francisco, Calif.**, Monadnock Building, erected in 1906, Frederick H. Meyer, Arch.; (center right) Headquarters building of Automobile Club of Southern California; (lower) **Los Angeles, Calif.**, Wholesale Terminal Building, having more than 2,000,000 square feet of floor area, John & Donald Parkinson, Architects.

Other Typical Sugar Pine Installations

Detroit, Mich., Henry Ford Hospital, sash and outside doors in good condition after 17 years of use.

Wyandotte, Mich., Michigan Alkali Co. plant, sash giving good service 14 years after installation.

Brooklyn, N. Y., Brooklyn State Hospital.

San Francisco, Calif., Financial Center Building, Frederick H. Meyer, Arch.

Greenwich, Conn., Greenwich High School.

Simsbury, Conn., Walker School.

Brentwood, Long Island, N. Y., Hospital group.



SUGAR PINE WINDOWS—(1) San Francisco, Calif., One Eleven Sutter Building, Schultze & Weaver, Arch.; (2) Minneapolis, Minn., Nurses Home, University of Minnesota, (Sugar Pine also used for doors, screens and storm windows), Clarence H. Johnson, Arch.; (3) Detroit, Mich., Office Building of Detroit Lumber Company, built in 1914 (Sugar Pine doors as well as windows); (4) Chicago, Ill., Cook County Nurses Home, completed in 1935, required approximately 2000 double-hung Sugar Pine windows, Eric E. Hall & Associates, Arch.; (5) Fort Worth, Texas, North Hi-Mount School, (Sugar Pine screens also), Wyatt C. Hedrick, Arch.; (6) Providence, R. I., Providence County Court House, Jackson, Robertson & Adams, Arch.

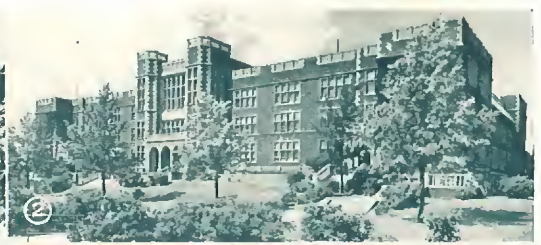
Window Sash

Window sash for efficient service must operate silently and easily, and give continued protection against the elements. These two points are of primary importance in determining the utility of a wood for sash.

The first is assured through the choice of a material that is light, yet strong for its weight. A light weight wood permits the use of lighter sash balances. It also requires less effort to operate the window and is less likely to be damaged from hard usage, as when a window is slammed shut. Tight putty joints between the wood and the glass are essential. A light weight wood has greater resiliency and serves as a bumper for both the frame and the glass. If a window sticks or rattles after it has been carefully fitted, it indicates that there has been a change in the dimensions of the sash. The possibility of this occurring and the need for high insulating values in a wood are apparent, if one considers the differences of temperature and atmospheric

moisture that often occur (as in winter or during rains) on the opposite sides of a single thickness of sash material. A wood of low shrinkage values changes less in its dimensions under varying atmospheric conditions, and when made into sash it can be snugly fitted, knowing that the window will always operate easily afterwards.

Protection against the elements is influenced in sash to a considerable extent by the design. Good designs have been pretty well established by past experience, but without accurate workmanship both in machining the sash parts and in their assembly, much of the value of good design is lost. Experience has also shown that accurate workmanship can best be obtained by using a soft, evenly grained and textured wood, which can be cut at any angle or to any pattern easily. Use of such a wood also reduces the carpentry time necessary for attaching hardware and fitting sash, without lessening the quality of the work done. Finely moulded cross bars,



SUGAR PINE WINDOWS—(1) Saratoga Springs, N. Y., Gideon Putnam Hotel, outside doors and trim also of Sugar Pine; (2) Minneapolis, Minn., Central High School, Sugar Pine window frames and sash installed about twenty years ago, William B. Ittner, Arch.; (3) Fort Worth, Texas, Lily B. Clayton School, windows and screens of Sugar Pine, P. M. Geren, Arch.; (4) Los Angeles, Calif., Biltmore Hotel, Sugar Pine window frames as well as sash, Schultze & Weaver, Arch.; (5) Circle-top, Gothic sash of Sugar Pine for an Ohio building; (6) San Francisco, Calif., Palace Hotel, built in 1909, Trowbridge & Livingston, Arch.; (7) Los Angeles, Calif., Gaylord Apartments, Sugar Pine sash and screens.



SUGAR PINE WINDOWS—(1) Palladian window and frame; (2) San Antonio, Texas, Smith-Mowinkle Ranch House, Harvey P. Smith, Arch.; (3) Baltimore, Md., sash, doors, shutters and trim made of Sugar Pine, Palmer & Lamdin, Arch.; (4) Santa Monica, Calif., Sugar Pine sash and window frames, William J. Gage, Arch.; (5) Sugar Pine fixed sash of large size.

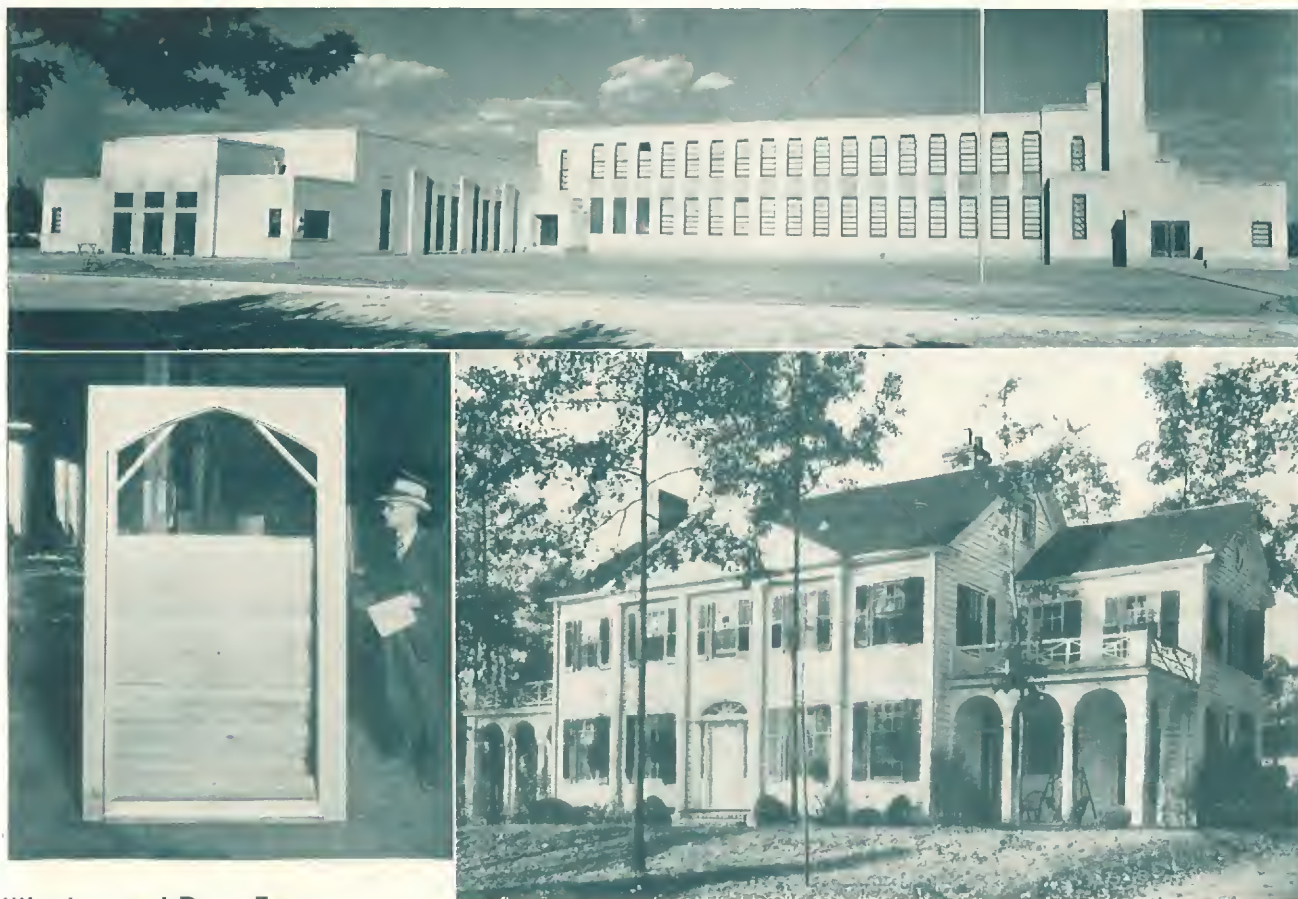
in sash with small panes, demand a wood that shows no tendency to split or sliver, either during manufacture or while in service. A soft-textured wood is preferable also when the window is to be weather stripped.

Appearance, too, is a requisite since the looks of both the interior and exterior of any structure are greatly influenced by its windows. Good appearance is conditioned upon the performance of the wood during the machining of the moulded portions of the sash, and upon painting. It has been pointed out before that soft texture and easy working qualities in a wood play an important part in producing accurately cut sash. Light color, absence of hard or cross grain, absence of natural oils, acids and resins, slight shrinkage, and an absorbent paint gripping texture, are factors that influence the effectiveness of painting.

The essential properties of a sash wood, in their relative order of importance are:

1. Ease of working.
2. Ability to stay in place (not shrink and swell).
3. Light weight.
4. Resistance to weathering.
5. Freedom from splitting and slivering.
6. Ease of painting.
7. Light color.





Window and Door Frames

The construction of the framing around window and door openings is very important to the effective service of the sash and doors. If properly selected and installed, the joints will be so closely fitted as to exclude the entrance of air, dust, and water. A good wood, a satisfactory paint job, and good workmanship are essential to this end. The character of the painting also affects the appearance of the frame, and aids its resistance to weathering. For these reasons proper design is not only essential but a wood should be used which is readily workable and of soft, even and absorbent texture. The ease with which the frame parts are nailed together influences the cost of installation and the effectiveness of the work. A wood that shows no tendency to split is preferred. Sufficient hardness is necessary, especially for the pulley stiles of a window frame. As in the case of a door, a wood that mortises easily, permitting quick fitting of hardware, has many advantages.

A wood that ranks high in the following properties will ordinarily give good service when used in window and door frames:

1. Ease of working.
2. Low shrinkage values.
3. Ability to take and hold nails and screws.
4. Ease of painting and finishing.
5. Resistance to weathering.
6. Strength and sufficient hardness.

Amarillo, Texas, Junior College, Sugar Pine frames, sash, doors and exterior trim, A. Callander, Arch.; (lower left) Sugar Pine window frame for Russ Building, San Francisco, Calif.; (lower right) Sugar Pine woodwork on all exposed wall surfaces is good insurance against weathering and decay.

Screens

Screen sash and screen doors must present a good appearance but primarily these should provide a tight fitting covering for the window and door opening, and be easily operated. Likewise, with the changing seasons, be put in place and removed with a minimum of effort. A wood for screen construction should be selected with the following properties in mind:

1. Light weight.
2. Ability to stay in place.
3. Workability.
4. Ease of painting.
5. Resistance to weathering, particularly grain raising.
6. Take screws without splitting, and without tearing fibers.

Exterior Millwork and Trim

Besides doors and sash, other important items of millwork for exterior use include: porch columns, balusters, shutters, mouldings, cornices and window trim. A very definite part of their usefulness is to improve the appearance of the building in which they are used.



Soft and even texture greatly improves the workability of a wood and readily enables the woodworker to faithfully reproduce any design however difficult. Both at the factory where the products are fashioned, and when fitted or installed in the building, ease of working, nailing and freedom from splitting makes it possible for the craftsman to turn out good work in faster time. The wood should retain its original form and dimensions, and resist weathering when exposed to varying atmospheric conditions. Some woods have more marked abilities in this direction than others. Low shrinkage value is a good guide. This property when further aided by a wood's ability to absorb paint evenly improves the effectiveness and lasting qualities of the paint coat, particularly if these values are not reduced because of the presence of objectionable properties, such as pitch, wood oils or similar substances which may penetrate or discolor the finish. Light colored wood is preferred.

Briefly, the properties of greatest importance in a wood for exterior millwork and trim are:

1. Workability.
2. Ability to stay in place.
3. Good painting characteristics.
4. Light color.
5. Resistance to weathering and decay.
6. Freedom from splitting when nailed.
7. Ease of gluing.

Bevel Siding

Bevel Siding of either narrow or wide widths serves a dual purpose. Protection against the weather is of course its principal function. At the same time the appearance of a side wall is improved through the use of wood siding. The shadows cast by the thick overlapping edges break up the monotony of an otherwise flat and uninteresting wall surface. The most efficient wood for this use is one which, when cut even to a thin edge, will not split in nailing or shrink, particularly endwise. It should resist weathering, cut and fit easily, have good insulating values. If light colored, as well as possessed of good painting characteristics, so much the



SUGAR PINE EXTERIOR MILLWORK, TRIM AND SIDING—There is no house so truly American as one covered with bevel siding. Wide novelty siding may be effectively used below the water table on a house built on a sloping lot. All of the exterior woodwork—entrance door, garage doors, shutters, window sash and frame, cornice work and bungalow siding—on this **San Leandro, Calif.**, prize home (shown next above bottom illustration) designed by Allen Wilnot, Arch., is made of Sugar Pine. A **Minneapolis, Minn.**, home (bottom picture) after its stucco walls were recovered with attractive Sugar Pine bungalow siding of high insulating value.

better. The properties of a wood for siding might be listed in order of importance about as follows:

1. Resistance to weathering.
2. Slight shrinkage.
3. Freedom from nail splitting.
4. Good painting characteristics.
5. Light color.



SUGAR PINE fence; (right) Baltimore, Md., residence—all "white" woodwork of staircase, radiator grill, and window is Sugar Pine; (lower) Sugar Pine kitchen cupboards and window in a California home.

Fences and Garden Furniture

Trellises, lattice, pergolas, fences, rose arbors and other garden furniture, have much to do with the beauty and charm of the garden and grounds surrounding a building. Consequently appearance is the first requisite of this use. Careful planning, good design, and use of a suitable wood are all essential.

To assure the desired sharpness and beauty of line as well as the best in workmanship, the wood must be easily shaped, cut and fitted. Because of its exposure to the elements, the wood utilized for such purposes must possess the natural ability to stay in place, resist weathering—particularly grain raising, and take and retain paints and other finishes in excellent manner. Any wood, where the parts are in contact with the soil, should of course be given a preservative treatment.

The requirements for this use are:

1. Ease of working.
2. Ability to stay in place.
3. Resistance to weathering.
4. Take and hold paint well.
5. Nail easily without splitting.

Stair and Cabinet Work

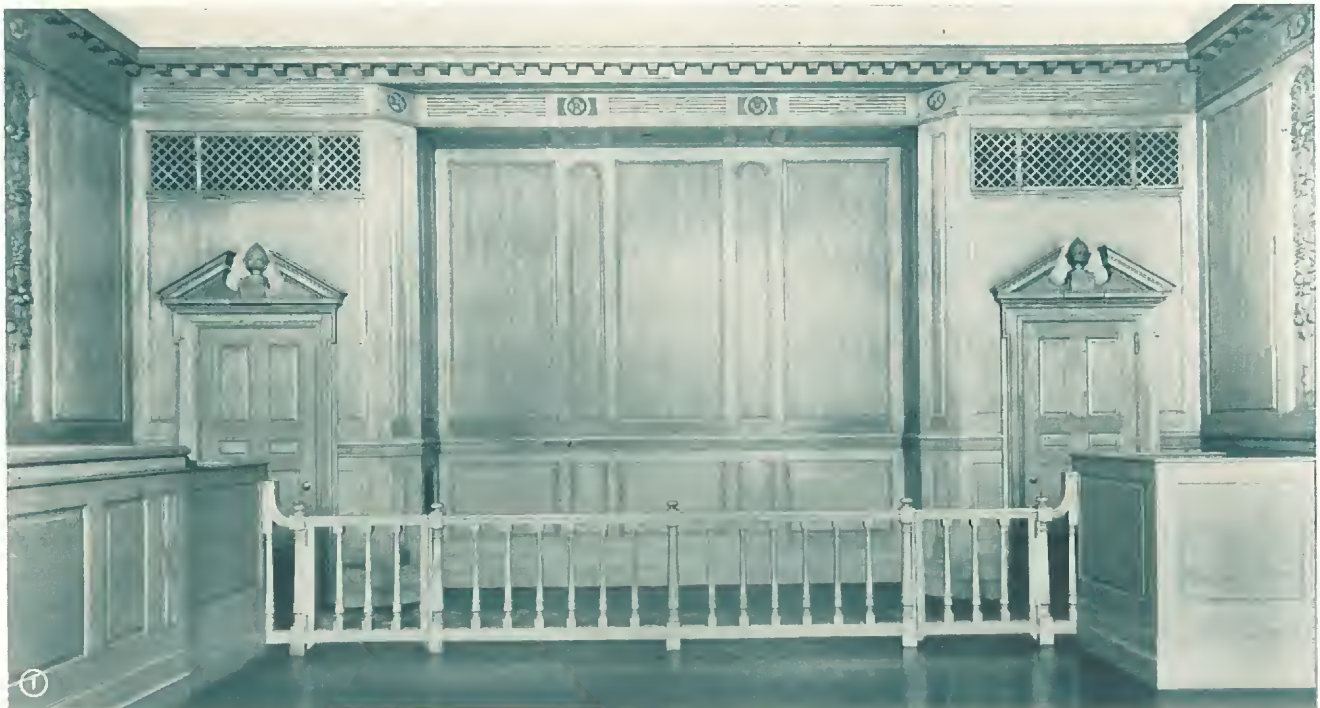
Cabinet work, as distinguished from millwork, involves a certain amount of hand joinery. It includes the manufacture of "permanent furniture", or built-ins, such as book cases, dressing tables, linen cases, kitchen, medicine and telephone cabinets, cupboards, china closets, breakfast nooks, ironing boards, broom closets, laundry chutes, flour and sugar bins, and numerous other articles of this type. Products of this kind must present a satisfactory appearance and all moving parts must operate easily and quietly.

A soft, uniformly textured wood is peculiarly adapted to cabinet work. It is easily shaped, thus permitting excellent workmanship, smooth surfaces, and beauty in line and contour. A wood for this purpose must not change dimensions or shape under service conditions. It should readily take enamels, stains and other finishes. It is also important that the wood takes nails, screws and other fastenings without splitting and glues up satisfactorily. Light weight is likewise desirable.



Thus a wood for cabinet work should possess the following:

1. Ease of working.
2. Ability to stay in place.
3. Ability to take enamels, stains and other finishes.
4. Ease of nailing without splitting.
5. Ease of gluing.
6. Light weight.



SUGAR PINE PANELING—(1) Paneling and wood carvings in Providence County Court House, **Providence, R. I.**, Jackson, Robertson & Adams, Arch.; (2) Executive's office, **Springfield, Mass.**, showing clear paneling, trim around windows, bookcase and mouldings—finished natural; (3) Restaurant in Extensible Bldg., U. S. Department of Agriculture, **Washington, D. C.**; (4) Sugar Pine is especially appropriate for faithful reproduction of detail and for smooth enameled work.

Wall Paneling and Wainscots

Wood wall paneling is intended to provide both background and decoration for the room. The design in all cases has much to do with the effect produced, but as is true with all interior finish, the natural properties and characteristics of the wood are a very real element in the actual results secured. Excellence in line and contour, smoothness of surface and the best in workmanship demand a wood that is readily shaped, worked and moulded. Assurance that both shape and dimension will remain unchanged under service conditions calls for woods of low shrinkage (ability to stay in place). Ease of finishing with stains, enamels or other finishing treatments is obviously essential and in fine work of this kind the wood must nail easily without splitting. Such requirements apply to both clear and knotty paneling. When finished natural, a wood with subdued grain produces a most pleasing effect.



SUGAR PINE TRIM AND MOULDINGS—(1) Narrow strips of Sugar Pine laid over canvassed walls in sun room of a southern California residence; (2) Sugar Pine is well suited for china cabinets, wainscoting and wide crown mouldings; (3) Hand carved Sugar Pine mouldings on a living room ceiling; (4) Turned table legs, built-ins, and wide mouldings in dressing alcove of bedroom.

Interior Finish and Mouldings

The first requirement of mouldings, window and door casings, mantels, stairs, base boards and all other forms of interior trim, is that a pleasing effect upon the eye should be produced. This is the primary purpose of interior finish, not only at the time of installation but continually through long years of service. Design and workmanship are necessary in no small measure to bring this about, but the natural properties and characteristics of the wood selected for this use are of the utmost importance.

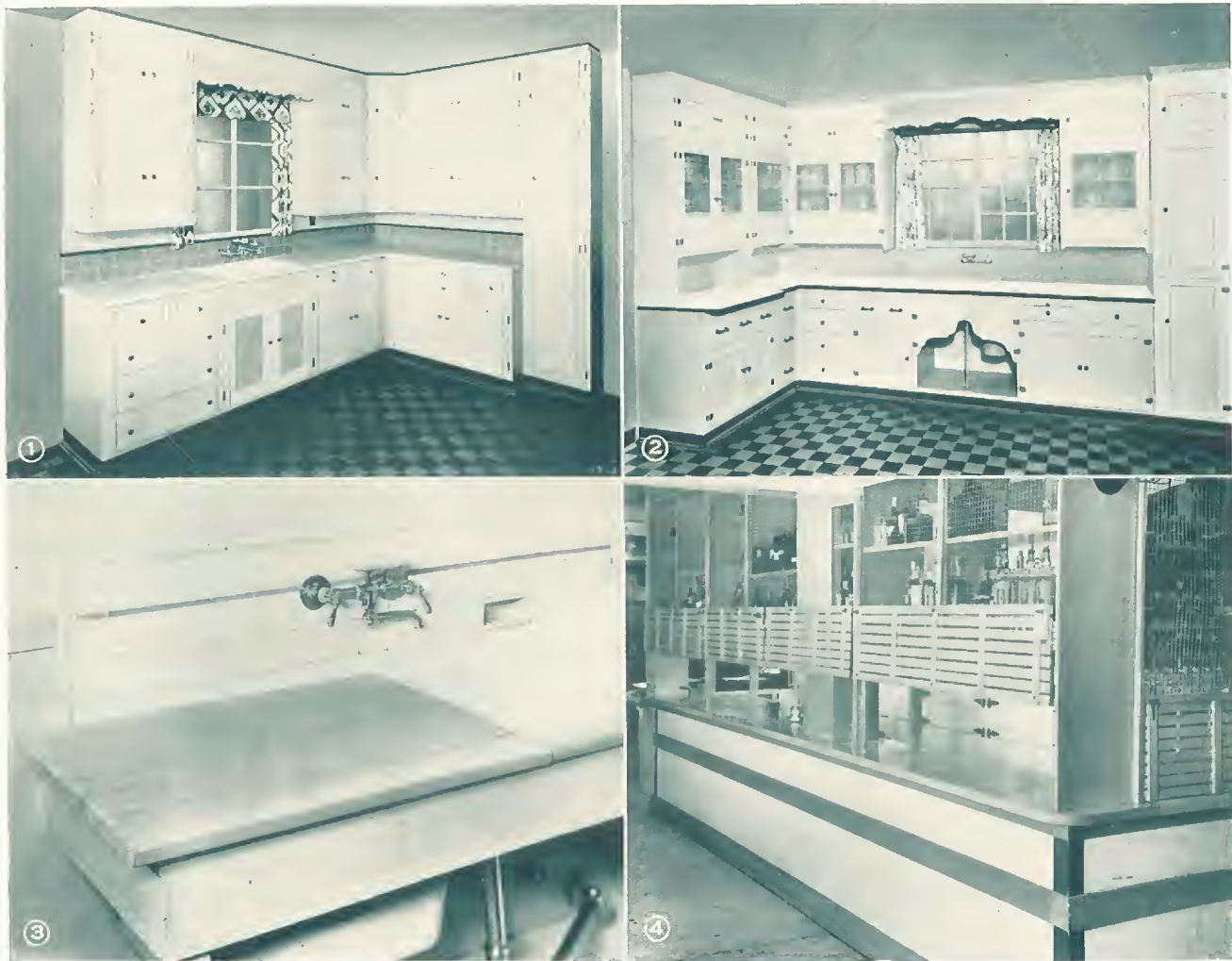
The character and architectural effects so essential for interior finishing can be assured by the use of a soft uniform-textured wood that is easily worked and thus permits excellent workmanship, smooth surfaces, sharp lines and contours. Naturally the wood must not change shape or dimensions after being placed in service. It must readily take and retain stains, enamel and all other types of finishing and for natural finishes possess character of grain to produce satisfactory effects.

Selection of a wood for interior finish should be based upon the following:

1. Well seasoned stock.
2. Workability.
3. Low shrinkage.
4. Ease of painting and finishing.
5. Freedom from excessive pitch, gums and coloring matter.
6. Sufficient hardness.
7. Resistance to splitting.
8. Pleasing appearance of grain.

Shelving

There is of course a wide range in the types and kinds of shelving. Such variation, however, is met largely by differences in design, workmanship, and size and grade of the material. With few exceptions the wood properties required are common to all. A wood to be suitable for shelving purposes must work easily, be light yet reasonably strong, come well manufactured and seasoned, take nails and screws without splitting, glue well, and finish in excellent manner.



SUGAR PINE DRAINBOARDS AND COUNTER-TOPS—(1) and (2) Eight-foot Sugar Pine drainboards—"easy" on glassware and fine china. The wood is also well liked for drawer fronts, doors and shelves of kitchen cabinets; (3) One-piece Sugar Pine drainboard in kitchen of a San Francisco, Calif., apartment; (4) Sugar Pine counter-top in service bar of dining room, Palace Hotel, San Francisco.

The wood properties governing the selection of wood for shelving are:

1. Ease of working.
2. Light weight.
3. Well manufactured and seasoned.
4. Receive nails and screws easily without splitting.
5. Take paints, stains and enamels readily.

Drainboards

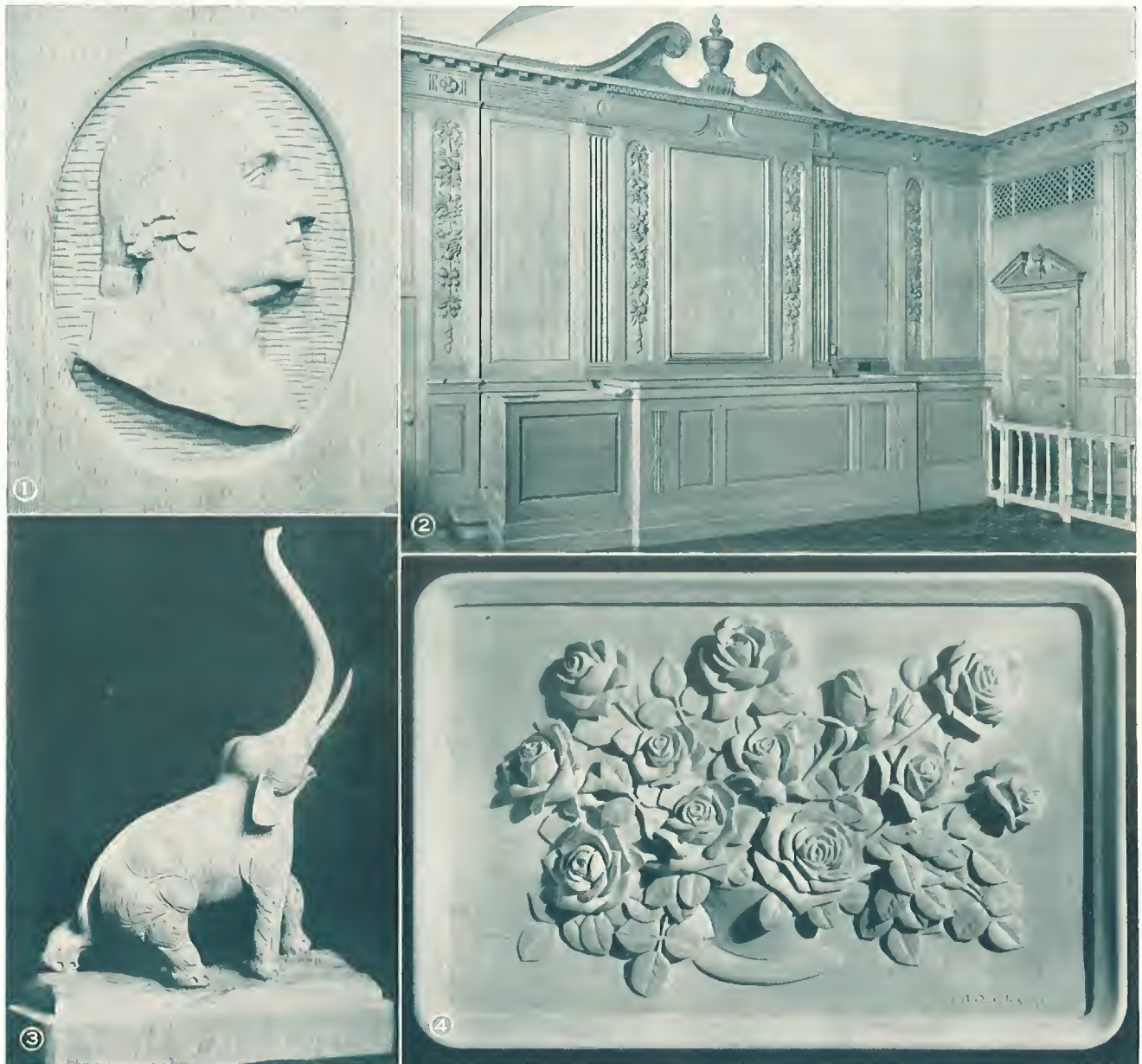
The resiliency or cushioning of soft-textured wood drainboards has saved many a piece of china from chipping or breaking while being cleaned. One-piece boards with clear faces are usually preferred. A white colored wood which surfaces smoothly, gives a clean cheerful appearance to a kitchen. The wood should varnish well and be free from warp or tendency to split. Ease of working is another favorable characteristic, as also is freedom from raised grain.

One-Piece Special Cuttings

For many industrial and building uses of wood one-piece clear cuttings offer more advantages than when they are built-up from many narrow, clear pieces. Drainboards, counter tops, drawing and cutting boards, wide panels and some items of softwood furniture are representative of these uses. For such purposes, the plentifulness of wide or thick clear pieces assumes greater importance among the factors to consider when selecting a wood for the use.

Small Industrial Cuttings

Carpenter's levels, shade rollers and slats, small toys, furniture, scroll work, decorations, picture frames, and parts of beehives usually require a wood of soft, even texture and slight, straight grain. Light weight, light color, good nailing, gluing and painting qualities, freedom from pitch, ability to stay in place without warping, twisting or splitting are also important in a wood put to these uses.



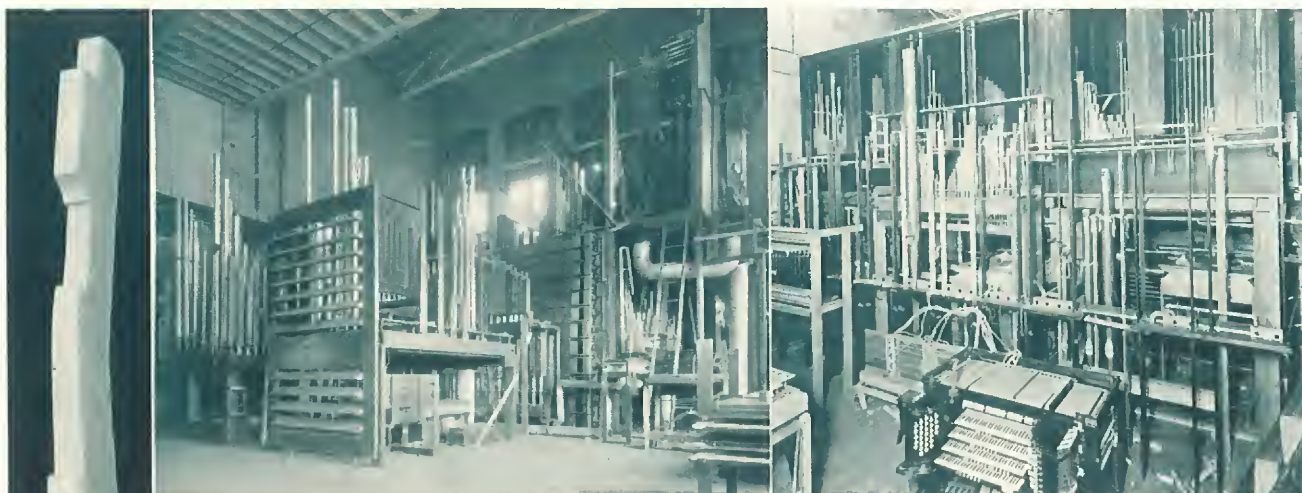
SUGAR PINE CARVINGS AND TURNINGS—Both amateur and professional wood carvers and turners like Sugar Pine. (1) The work of a high school boy (piece is 16" wide); (2) Hand carved panels and wide panels of Sugar Pine, Room No. 9, Providence County Court House, Providence, R. I.; (3) Carved out of a single block of Sugar Pine; (4) Floral piece carved out of a Sugar Pine plank 2" thick, 20" wide, 26" long, natural finish.

Wood Carvings and Wood Turnings

Only those woods which are soft, straight-grained, free from pitch and uniform in texture are the most acceptable for wood carving purposes. Every whittler and carver of wood will testify to the correctness of this statement. When one works with a pocket knife or carving tool he wants above all, a wood that is uniformly soft in texture which will cut either with or across the grain, yet not so soft in its structure as to crush or dent easily or so brittle as to split or break in handling or when shaped into small, unsupported designs. Some carvings are best made from large blocks of wood, others may be built up from smaller pieces. In the first instance the availability of the supply of large, one-piece blocks will influence the choice of the wood to

use. In the second case, the wood must have good gluing qualities and must not easily fracture along the grain. Thoroughly dried stock is essential.

In a way, a good wood-turning wood is one possessed of like characteristics, that will respond satisfactorily when placed in a turning lathe and shaped to difficult patterns. Balusters with spiral turnings (simulating twisted rope) are examples of the more difficult patterns which require selection of the best wood that is available for the purpose. In both wood carvings and wood turnings the cost of the raw material is insignificant compared to the labor expense represented in the article. Therefore it is good economy to select the best wood for the purpose regardless of its cost.



Piano Keys and Organ Pipes

Piano keys and organ pipes are highly specialized wood uses. The long list of commercial woods available for general purposes is greatly restricted when one considers the suitability of these woods for the items discussed under this heading. As for some other exacting uses, cost of the raw material is greatly subordinated in favor of other more important considerations.

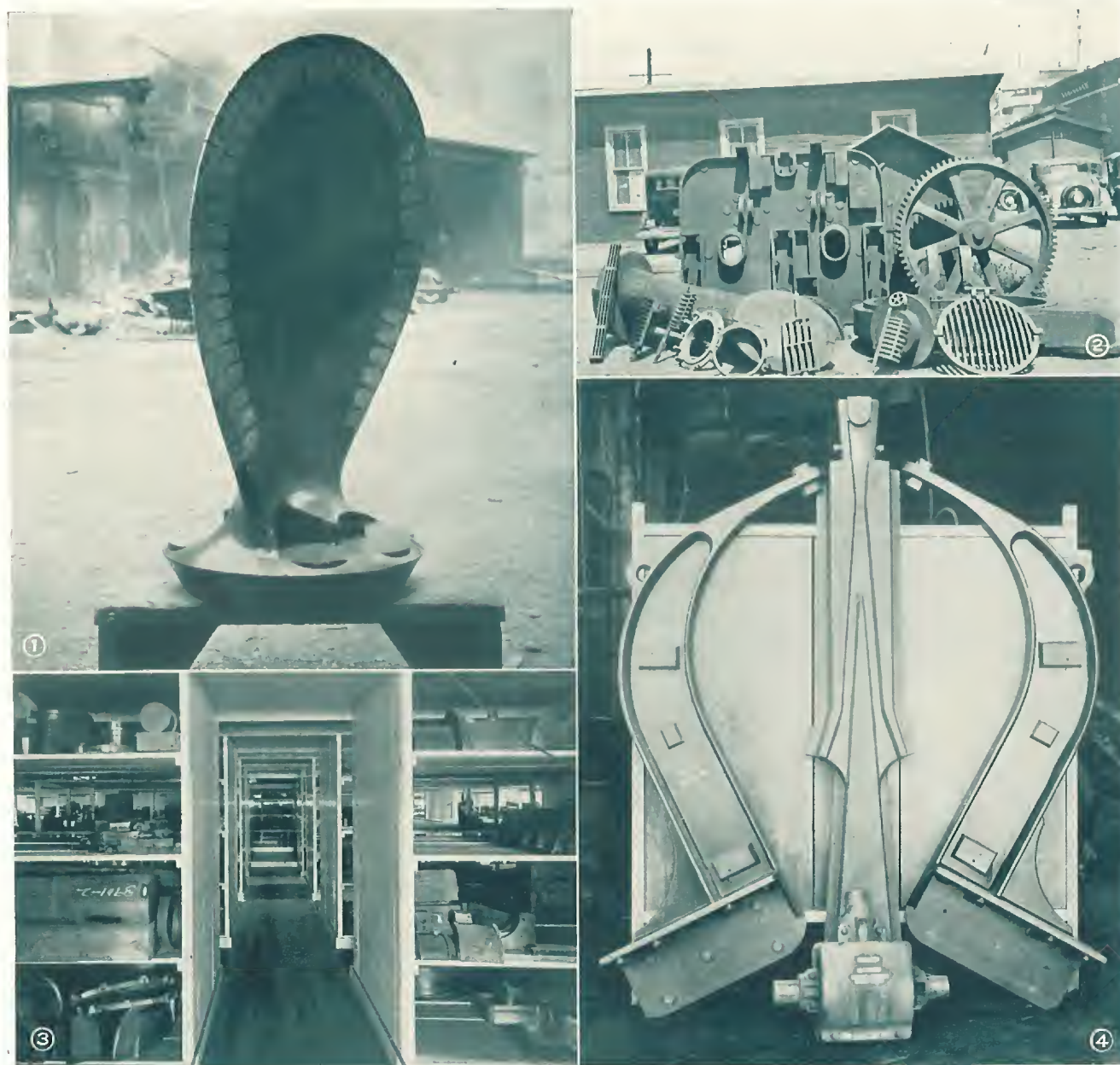
For organ pipes a resonant, easy cutting wood with straight grain and ability to stay in place without splitting, warping or appreciable change in dimensions under varying atmospheric conditions is paramount. Likewise, piano keys, which are milled to what appear to be "awkward" angled pieces for assembly into the piano keyboard, must stay in place without change of position. Soft texture for easy cutting is essential. So, too, are good gluing properties in a wood, for once the small hardwood overlays and the ivory facings are applied they must stay attached for all time if the best service is to be secured from the finished article. A pitchy wood is "outlawed" for this use.

Sugar Pine was used in the articles shown on this page.



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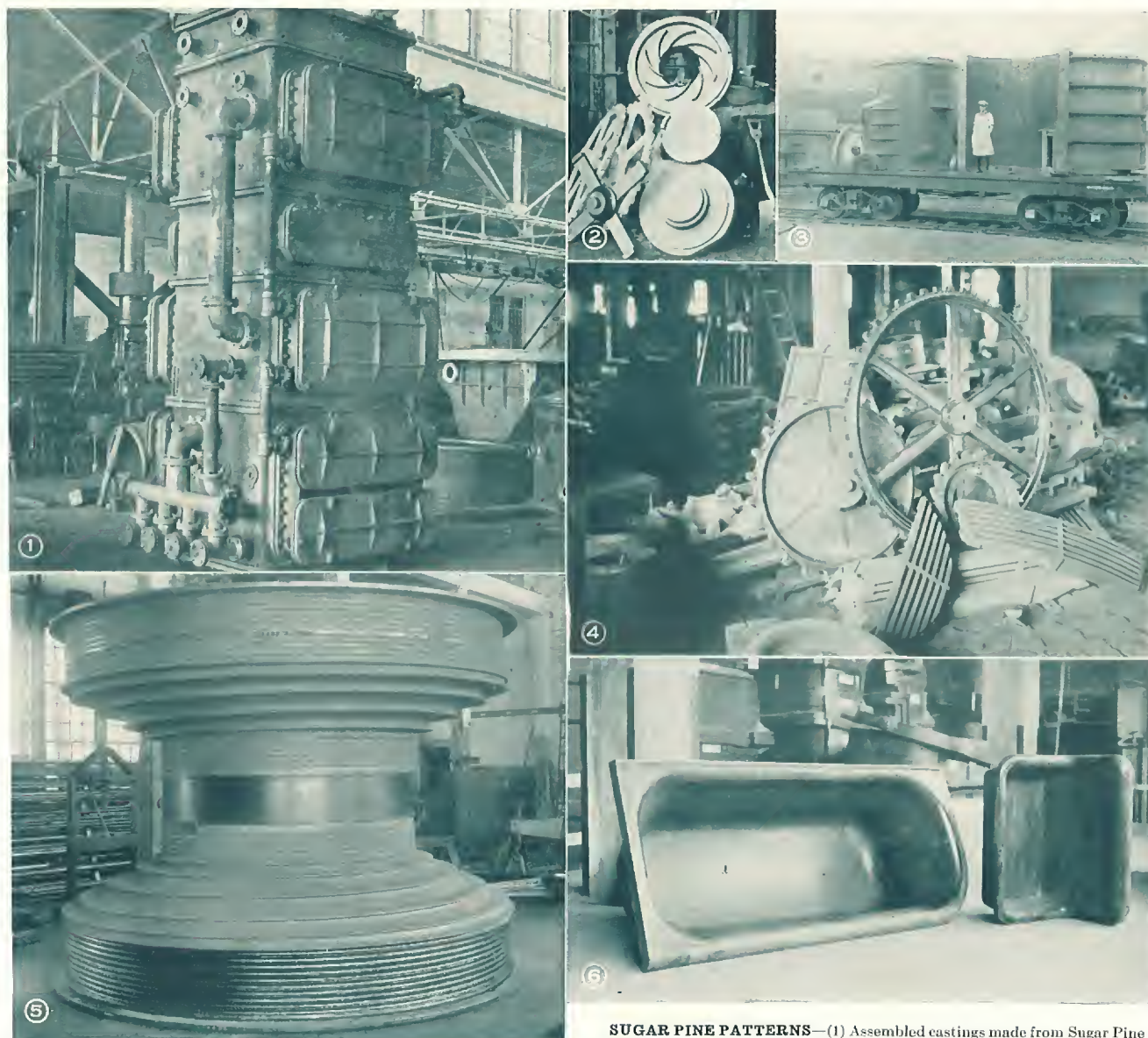
Foundry Patterns and Flasks

For the making of foundry patterns, the requirements are more exacting than for many other common uses of wood. Quite obviously, light weight is desirable. It is also a factor after the patterns are made. If some of the large complicated models were made of dense, heavy wood, they could be handled only with the aid of machinery and their weight would often prove a serious handicap in lifting them out of the sand.

Easy cutting is an essential factor in a good pattern wood. It must cut in any direction, with or across the grain. Not only must it respond readily to sharp tools, but do so without unnecessary dulling. To fulfill this requirement, a wood must be reasonably soft (without being pithy), straight-grained, uniform in texture, and of a fiber that does not "fuzz up".

SUGAR PINE FOUNDRY PATTERNS—(1) Large propeller blade, Bethlehem Shipbuilding Corp., Ltd., San Francisco, Calif.; (2) Marine patterns, Todd Mobile Dry Docks, Inc., Mobile, Ala.; (3) Store room for Sugar Pine patterns; (4) 6-ft. Sugar Pine patterns. Lower picture on page 27 is pattern for section of a water wheel, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

Freedom from shrinking and swelling is of the greatest importance because the permanent usefulness of a pattern depends upon its ability to keep its shape. The most accurate workmanship would be destroyed, and effort wasted, if the wood in a pattern were to shrink so as to change its dimensions. No woods are absolutely free from shrinking and swelling, but those woods which possess the slightest shrinkage consistent with other necessary qualities, are sure to give satisfaction. Patterns which are used over and over again, and go in and out of storage many times, are subjected to severe wear. A good pattern wood must not be so soft as to dent or mar easily, or otherwise lose its form through abrasions.



SUGAR PINE PATTERNS—(1) Assembled castings made from Sugar Pine patterns, Kutztown Foundry & Machine Co., Kutztown, Pa.; (2) Sugar Pine is used for many small patterns; (3) Pattern and core box for 8½-ft. diameter condenser, Worthington Pump & Machinery Corp., Harrison, N. J.; (4) Gear and grate patterns, requiring wood which will hold its shape, (foundry flasks, in left background); (5) 50,000-lb. hoisting drum casting from Sugar Pine cores, Robert Holmes & Bros., Inc., Danville, Ill.; (6) Plumbing patterns, Standard Sanitary Manufacturing Co., Richmond, Calif. Sugar Pine is used too in making wood replicas of new body models of automobiles, full size and completely finished.

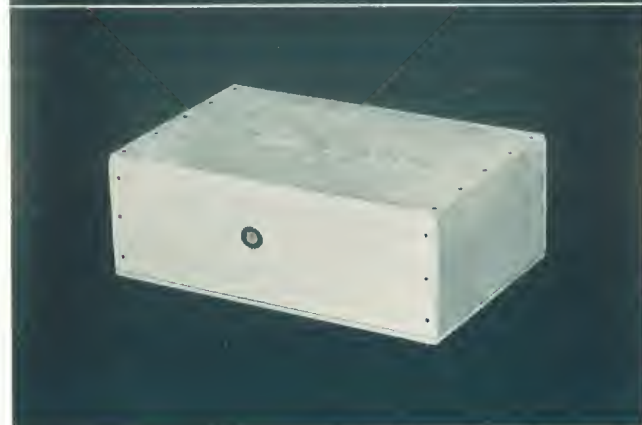
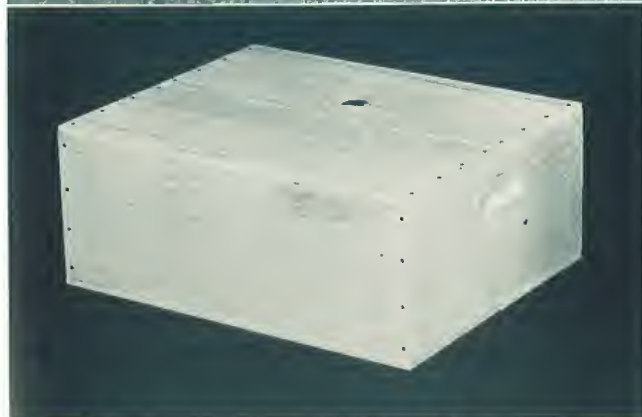
Patterns are assembled to a large extent, by the use of nails and screws, and lifting plates must be attached for convenient handling. A good pattern wood should receive nails and screws without splitting, even when they are driven close to the edge, and should hold them tightly. Glue is also used extensively in pattern work and the wood must be porous enough for the glue to penetrate and hold tightly. A wood that takes glue well also offers a good gripping surface for paint and varnish. Exceptional strength is not required of patterns, but, at the same time, the wood should be sufficiently strong to withstand the stresses developed in handling to and from storage and in lifting from the sand. The use often requires pattern lumber of large dimensions, and there is an advantage to the kind of wood which has such sizes in plentiful supply.

The shape-holding quality of a wood when cut to thin and irregular forms is, perhaps, one of the most

important needs of a wood when made into templates.

Flask lumber, though usually of lower grade than that required for patterns, must have similar valuable characteristics. The important requirements of a wood for patterns, then, are:

1. Soft easy working texture.
2. Freedom from shrinkage and swelling.
3. Resistance to wear.
4. Nail holding ability.
5. Good gluing qualities.
6. Painting properties.
7. Fair degree of strength.
8. Light weight.
9. Ample supply of desired sizes and grades.



Boxes and Crates

A satisfactory shipping container must afford, at a relatively low cost, the necessary protection to the product for which it is designed, and be light in weight in order to assure minimum transportation charges.

Obviously it is essential that such a wood can be obtained abundantly and at reasonable cost. In addition, a wood must possess certain definite properties if it is to be suitable for box construction. It must be light but reasonably strong, particularly as to shock resistance. The wood must be easily worked, comparatively free from warping, nail easily yet resist splitting, be light in color and free from objectionable taste or odor. An excellent box material should, therefore, meet the following requirements:

1. Available in quantity at reasonable price.
2. Strong for its weight, and resilient.
3. Nail easily without splitting.
4. Easily manufactured.
5. Stay in place.
6. Light in color.
7. Mill smoothly.
8. Free from objectionable taste and odor when used to package certain foodstuffs.

Crating material should generally meet the same requirements, although strength should be given still more consideration.

SUGAR PINE fruit and vegetable containers; beehives (top) on many farms are made of this wood; sailboat (at left) has Sugar Pine joiner work. Light, outboard motor boats and yacht dinghies are often planked with Sugar Pine. Boys use it for their model boats and other work shop articles of wood.

Recommended Grades of Sugar Pine

CONSTRUCTION USES

	<i>High Cost</i>	<i>Medium Cost</i>	<i>Low Cost</i>
Base - - - - -	1&2 Clr	C Sel-D Sel	D Sel
Bevel Siding - - - - -	B&Btr Siding	C Siding	D Siding
Blinds, Outside- - - - -	No. 1 Blinds	No. 1 Blinds	No. 2 Blinds
Built-in Fixtures - - - - -	1&2 Clr-C Sel	D Sel-3 Clr	2&Btr Com-Inch Shop- 1&2 Shop
Bungalow Siding - - - - -	1&2 Clr-C Sel	D Sel	2&Btr Com
Casing- - - - -	1&2 Clr-C, Sel	D Sel	D Sel
Ceiling - - - - -	1&2 Clr-C Sel	D Sel	2&Btr Com-3 Com
Chutes, Laundry - - - - -	1&2 Clr-C Sel	D Sel	2&Btr Com
Colonial Siding - - - - -	1&2 Clr-C Sel	C Sel	D Sel
Concrete Forms - - - - -	2&Btr Com	3 Com-4 Com	4 Com
Cornices - - - - -	1&2 Clr-C Sel	D Sel	1 Com-2 Com
Cupboards - - - - -	1&2 Clr-C Sel	D Sel-3 Clr	D Sel
Doors - - - - -	No. 1 Doors	No. 2 Doors	No. 2 Doors
Door Frames - - - - -	1&2 Clr	C Sel	D Sel
Drain Boards - - - - -	1&2 Clr	C Sel	D Sel
Drop Siding - - - - -	C Sel	D Sel	2 Com-3 Com
Flooring (covered) - - - - -	D Sel	2&Btr Com	3 Com
Flooring, Porch - - - - -	C Sel	C Sel	D Sel
Garden Furniture- - - - -	1&2 Clr	C Sel	D Sel
Jambs - - - - -	C Sel-D Sel	D Sel	2&Btr Com
Lath - - - - -	No. 1 Lath	No. 1 Lath	No. 2 Lath
Log Cabin Siding, Thick - - - - -	2&Btr Com	2&Btr Com	2&Btr Com
Mouldings - - - - -	Standard Grade	Standard Grade	Standard Grade
Paneling, Enameled - - - - -	1&2 Clr-C Sel	D Sel	D Sel
Paneling, Knotty - - - - -	Special	Special	2&Btr Com
Partition - - - - -	1&2 Clr-C Sel	D Sel	2&Btr Com
Porch Columns - - - - -	1&2 Clr-C Sel	D Sel	2&Btr Com
Porch Work - - - - -	1&2 Clr-C Sel	D Sel	2&Btr Com
Railings - - - - -	Standard Mldg.	Standard Mldg.	Standard Mldg.
Roof Boards - - - - -	2&Btr Com	3 Com	4 Com
Screens - - - - -	Standard	Standard	Standard
Sheathing - - - - -	2&Btr Com	3 Com	4 Com
Shelving, Pantry - - - - -	C Sel	D Sel	2&Btr Com-3 Com
Stair Treads and Risers- - - - -	1&2 Clr	C Sel	D Sel
Stair Stringers - - - - -	1&2 Clr-C Sel	D Sel	Thick No. 2 Com
Shutters and Louvres - - - - -	No. 1 Blinds	No. 1 Blinds	No. 1 Blinds
Stepping - - - - -	1&2 Clr-C Sel	D Sel	2&Btr Com
Sub-Flooring - - - - -	2&Btr Com	3 Com	3 Com
Trim, on Cabins - - - - -	C Sel-D Sel	2&Btr Com	3 Com
Trim, Exterior - - - - -	1&2 Clr-C Sel	D Sel	2&Btr Com
Trim, Interior - - - - -	1&2 Clr	C Sel	D Sel
Wainscoting- - - - -	1&2 Clr	C Sel	D Sel
Window Frames (special) - - - - -	1&2 Clr-C Sel	D Sel-2&Btr Com	2&Btr Com
Window Frames (stock) - - - - -	Clear Frame	Clear-No. 1 Frame	No. 2 Frame
Window Sash - - - - -	Standard Sash	Standard Sash	Standard Sash

Recommended Grades of Sugar Pine

FACTORY USES (Stock Sash, Door and Millwork Factories)

Blinds - - - - -	C&D Sel-Inch Shop
Book Cases - - - - -	1&2 Clr-3 Clr-C Sel-D Sel
Casings - - - - -	3 Clr-Inch Shop-2&3 Shop
Doors:	
Stiles - - - - -	3 Clr-1 Shop-2 Shop
Rails, Lock - - - - -	1 Shop-2 Shop-3 Shop
Rails, Top - - - - -	2 Shop-3 Shop
Muntins - - - - -	3 Clr-1 Shop- 2 Shop- 3 Shop
Door Frames - - - - -	3 Clr-Shop
Garden Furniture - - - - -	3 Clr-Selects-Shop
Ironing Boards - - - - -	3 Clr-C Sel-D Sel-Shop
Jambs, Door - - - - -	1 Shop-2 Shop
Lawn Seats - - - - -	C Sel-D Sel
Mouldings - - - - -	Selects-Moulding Lumber
Panels, Door - - - - -	3 Clr-1 Shop&Btr
Pergolas - - - - -	C Sel-D Sel-2&Btr Com
Pickets, Fence - - - - -	C Sel-D Sel
Porch Columns, Turned - - - - -	1 Shop-3 Clr-Selects
Porch Swings - - - - -	C Sel-D Sel-2&Btr Com
Rose Arbors - - - - -	C Sel-D Sel
Sash - - - - -	2 Shop-3 Shop
Screen Doors - - - - -	Selects-Inch Shop-2&3 Shop
Screen Sash - - - - -	Selects-Inch Shop-2&3 Shop
Shutters - - - - -	Selects-Shop
Sills, Door - - - - -	Thick Selects
Sills, Window - - - - -	Thick Selects
Storm Doors - - - - -	Selects-Shop-2&Btr Com
Storm Sash - - - - -	3 Shop-Inch Shop
Table Legs - - - - -	C Select
Table Tops - - - - -	C Sel-D Sel
Trellises - - - - -	C Sel-D Sel-Mouldings
Window Frames - - - - -	Selects-Shop-2&Btr Com

FACTORY USES (Special Millwork Factories)

Balustrades - - - - -	1&2 Clr-3 Clr-C Sel
Bins, Flour and Sugar - - - - -	3 Clr-C Sel-D Sel-Inch Shop
Blinds - - - - -	C Sel-D Sel-Inch Shop
Bookcases - - - - -	1&2 Clr-C&D Sel-Inch Shop-1&2 Shop
Boxes, Flower - - - - -	C&D Sel-Inch Shop-2&Btr Com
Breakfast Nooks - - - - -	C&D Sel-Inch Shop-1&2 Shop
Cabinets, Kitchen and Medicine - - - - -	C Sel-D Sel-Inch Shop-3 Clr
China Closets - - - - -	C&D Sel-Inch Shop-1&2 Shop
Columns, Porch - - - - -	1&2 Clr-C Sel-D Sel-3 Clr
Cupboards - - - - -	3 Clr-C Sel-D Sel-Inch Shop
Counter Tops - - - - -	1&2 Clr-C Sel-D Sel
Doors, Exterior - - - - -	C&D Sel-1&2 Shop
Doors, Garage - - - - -	C&D Sel-1&2 Shop-2&Btr Com
Doors, Interior - - - - -	C&D Sel-1&2 Shop
Doors, Knotty - - - - -	2&Btr Com
Doors, Screen - - - - -	C Sel-D Sel
Dresser and Wardrobe - - - - -	C Sel-D Sel
Drawer Bottoms - - - - -	C Sel-D Sel
Fixtures, Bank - - - - -	1 Shop&Btr-Inch Shop
Fixtures, Built-in - - - - -	1&2 Clr-C Sel-D Sel-Inch Shop-1&2 Shop
Fixtures, Store - - - - -	1&2 Clr-C Sel-D Sel-Inch Shop-1&2 Shop

Frames, Special Door - - - - -	1&2 Clr-C Sel-D Sel-1&2 Shop
Frames, Special Window - - - - -	1&2 Clr-C Sel-1&2 Shop-D Sel
Garden Furniture - - - - -	3 Clr-Inch Shop
Ironing Boards - - - - -	3 Clr-C Sel-D Sel
Jambs, Door - - - - -	D Sel-1&2 Shop-2&Btr Com
Linen Cases - - - - -	C Sel-D Sel
Mantels - - - - -	C Sel-D Sel-Inch Shop
Mouldings - - - - -	C Sel-D Sel-Moulding Lumber
Paneling, Enameled - - - - -	1&2 Clr-C Sel-D Sel
Paneling, Knotty - - - - -	2&Btr Com
Pergolas - - - - -	C Sel-D Sel-2&Btr Com
Pews - - - - -	1&2 Clr-C Sel
Pickets, Fence - - - - -	C Sel-D Sel
Rose Arbors - - - - -	C Sel-D Sel-Mouldings
Sash, Green House - - - - -	2 Shop-3 Shop
Sash, Screen - - - - -	C Sel-D Sel
Sash, Special Window - - - - -	C Sel-D Sel-3 Shop
Seats, Lawn - - - - -	C Sel-D Sel
Swings, Porch - - - - -	C Sel-D Sel-2&Btr Com
Stair Work - - - - -	1&2 Clr-C Sel-D Sel
Store Fronts - - - - -	1&2 Clr-C Sel-D Sel
Store Fronts, Metal Covered - - - - -	D Sel-2&Btr Com
Table Legs - - - - -	C Select
Table Tops - - - - -	C Sel-D Sel
Trellises - - - - -	C Sel-D Sel-Mouldings
Trim - - - - -	1&2 Clr-C Sel-D Sel

MISCELLANEOUS

Airplane Hangar Roof, Sheathing - - - - -	3 Com-4 Com
Airplane Hangar Siding - - - - -	D Sel-2&Btr Com-C&D Bevel Siding
Airplane Hangar Sliding Doors - - - - -	Sel-2&Btr Com-3 Com
Arbors, Rose - - - - -	C Select-D Select-Mouldings
Blackboards - - - - -	1&2 Clr-C Sel
Boats, joinery and exposed parts - - - - -	1&2 Clr-C Sel
Capital Decorations - - - - -	Selects-Shop
Concrete Forms - - - - -	2&Btr Com-3 Com
Construction Offices, Sheds and Enclosures - - - - -	3 Com-4 Com
Display Platforms - - - - -	2&Btr Com-3 Com
Doors, Metal Clad - - - - -	3 Com
Partitions, Office - - - - -	C Sel-2&Btr Com
Pergolas - - - - -	C Sel-D Sel-2&Btr Com
Porch Swings - - - - -	C Sel-D Sel-2&Btr Com
Shelving, Store - - - - -	C&D Sel-2&Btr Com-3 Com
Shelving, Warehouse - - - - -	2&Btr Com-3 Com
Shelving, Rough - - - - -	3 Com
Shelving, Glued Hardwood Edge - - - - -	D Sel-2&Btr Com
Sidewalks, Temporary - - - - -	3 Com
Spouts, Flour Mill - - - - -	1&2 Clr-C Sel
Trellises - - - - -	C&D Sel-Mouldings
Wood Carvings - - - - -	Selects-Shop

Recommended Grades of Sugar Pine

INDUSTRIAL SPECIALTIES

Agricultural Machinery	-	1&2 Clr-C Sel
Awning Rollers	- - -	Selects
Backing, Furniture and		
Mirror	- - - - -	3 Com-4 Com
Billboard Framing	- - -	2&Btr Com-3 Com
Billboard Mouldings	- - -	2&Btr Com
Boxes, Shipping	- - -	3 Com-4 Com
Boxes, Casket Shipping	- - -	3 Com
Caskets, Cloth Covered	- - -	2&Btr Com-3 Com
Card Tables	- - - - -	3 Clr-C Sel-D Sel
Chair Seats	- - - - -	D Sel-Inch Shop-1&2 Shop
Crates, Glass Plant	- - -	4 Com
Crates, Shipping	- - -	3 Com-4 Com-5 Com
Cutting Boards	- - -	1&2 Clr-C Sel-3 Clr
Drawing Boards	- - -	1&2 Clr-C Sel-3 Clr
Drawer Bottoms	- - -	C Sel-D Sel
Fence Pickets	- - -	C Sel-D Sel
Flasks, Foundry	- - -	2&Btr Com-3 Com
Flumes	- - - - -	2&Btr Com
Furniture, Garden	- - -	3 Clr-C Sel-D Sel
Furniture, Softwood	- - -	3 Clr-C Sel- D Sel
Gaskets, Large Pipe Lines	- - -	1&2 Clr-C Sel
Grandstand Seats	- - -	2&Btr Com
Ironing Boards	- - -	3 Clr-C Sel-D Sel
Map Rollers and Slats	- - -	Selects
Novelties	- - - - -	3 Clr-C&D Sel-Inch Shop-1&2 Shop
Organ Pipes	- - - - -	1&2 Clr-C Sel-Inch Shop
Pastry Boards	- - - - -	3 Clr-Inch Shop
Patterns, Foundry	- - -	1&2 Clr-3 Clr-C Sel-D Sel-Shop-2&Btr Com
Penholders	- - - - -	Selects-Shop
Piano Keys	- - - - -	Special Grade
Picture Frames	- - - - -	C Sel-D Sel-2&Btr Com-3 Com
Picture Backing	- - - - -	3 Com-4 Com
Refrigerator Backing	- - -	2&Btr Com-3 Com
Rug Poles	- - - - -	Selects
School Manual Training		
Lumber	- - - - -	3 Clr-C&D Sel-2&Btr Com-3 Com-Inch Shop
Signs, Small	- - - - -	D Sel-2&Btr Com
Scroll Work	- - - - -	Selects
Shade Rollers	- - - - -	Selects
Sounding Boards	- - -	Selects-Shop
Stadium Seats	- - - - -	2&Btr Com
Store Fixtures	- - - - -	Selects-Shop-2&Btr Com
Store Fronts (exposed)	- - -	C Sel-D Sel
Store Fronts (metal covered)	- - -	D Sel-2&Btr Com
Strips, Backing Metal Signs	- - -	2&Btr Com-3 Com
Table Legs, blanks or turned	- - -	C Select
Tables, Sample Room	- - -	D Sel-2&Btr Com-3 Com
Table Tops	- - - - -	C Sel-D Sel
Templates	- - - - -	Selects-Shop
Toys	- - - - -	3 Clr-Selects-Inch Shop

Theater Scenery Strips	- -	1&2 Clr-C Sel-D Sel
Theater Staging	- - -	2&Btr Com
Trunks	- - - - -	Selects
Tubs, Laundry	- - - - -	C Sel-3 Clr
Water Tanks	- - - - -	2&Btr Com
Washboard Stock	- - -	Short Selects, Inch Shop
Wagons (children) and		
Doll Buggies	- - - - -	Selects-Shop

FARM USES

Barn Siding	- - - - -	2&Btr Com-3 Com
Beehives	- - - - -	3 Clr-Inch Shop
Bevel Siding	- - -	B&Btr-C Siding-D Siding
Barn Boards and Battens	- - -	2&Btr Com-3 Com
Boxes, Fruit	- - - - -	
Brooders and Incubators		
Chicken Houses	- - -	2&Btr Com-3 Com
Chicken Feeders	- - -	2&Btr Com-3 Com
Corn Cribbing	- - -	2&Btr Com-3 Com
Corn Crib Floors	- - -	3 Com
Cornices, Barn	- - -	2&Btr Com-3 Com
Crates, Vegetable	- - -	3 Com-4 Com
Cupolas	- - - - -	D Sel-2&Btr Com
Drop Siding	- - - - -	C&D Sel-2&Btr Com-3 Com
Feeding Racks	- - -	2&Btr Com-3 Com
Fox Pens	- - - - -	2&Btr Com-3 Com
Fruit Driers	- - - - -	3 Com
Fruit Drying Trays	- - -	2&Btr Com
Garages.	See Construction Uses.	
Gates and Fences	- - -	2&Btr Com-3 Com
Gateways	- - - - -	C Sel-D Sel-2&Btr Com
Grain Chutes	- - - - -	2&Btr Com
Granaries	- - - - -	2&Btr Com-3 Com
Green Houses	- - - - -	3 Com
Green House Plant		
Frames	- - - - -	2&Btr Com
Grooved Roofing	- - -	2&Btr Com-3 Com
Hay Loft Floors	- - -	2&Btr Com-3 Com
Hay Rack Boards	- - -	2&Btr Com-3 Com
Hog Houses	- - - - -	2&Btr Com-3 Com
Hog Feeding Troughs	- - -	2&Btr Com-3 Com
Ice Houses	- - - - -	3 Com
Machine Sheds	- - -	2&Btr Com-3 Com
Rabbit Hutches	- - -	3 Com
Residence.	See Construction Uses.	
Roofs, Hay Stacks and		
Temporary Corn Cribs	- - -	3 Com
Seed Bed Boards	- - -	2&Btr Com
Stall Partitions	- - -	2&Btr Com-3 Com
Sheds, Tobacco	- - -	2&Btr Com-3 Com
Stock Shelters	- - - - -	3 Com
Wagon Boxes	- - - - -	C Sel-D Sel
Water Tanks	- - - - -	2&Btr Com
Watering Troughs	- - -	2&Btr Com
Wayside Market Buildings	- - -	3 Com
Well Curbing	- - - - -	2&Btr Com

5'x76"=3FT - STILE			5'x76"=3FT - STILE		
5'x76"=3FT - STILE			5'x40"=2FT-MUNTIN	5'x40"=2FT-MUNTIN	
10'x30"-2FT BOTTOM RAIL	10'x36"-2FT BOTTOM RAIL	9'x34"-2FT BOTTOM RAIL	10'x34"-2FT BOTTOM RAIL	10'x28"-2FT BOTTOM RAIL	

Factory Select (No. 3 Clear)—This piece is 21 inches wide by 16 feet long. It scales 28 feet surface measure. It contains 83.2% of cuttings.

10'x28"-2FT BOTTOM RAIL	6'x76"=3FT-STILE	10'x36"=2FT BOTTOM RAIL
6'x76"=3FT-STILE	6'x40"=2FT-MUNTIN	
6'x76"=3FT-STILE	6'x40"=2FT-MUNTIN	

No. 1 Shop—This piece is 25 inches wide by 16 feet long, and scales 33 feet surface measure. The total footage of acceptable door cuttings is 19½ feet, or 59%.

boards, counter tops, mantels, cabinets, built-ins, enameled work and all building items requiring high qualities. Because of its fine working properties and the fact that it is obtainable in wide widths, this grade is especially suitable for permanent patterns, beehives, wood carvings, turned work and picture frames.

D Select—Sugar Pine (page 43)

Description

D Select SUGAR PINE is the lowest recognized grade of finishing lumber, it is fairly smooth in appearance, and resembles the next higher grade, C Select, although the admissible imperfections are as a rule larger or more numerous.

A piece may contain several small and medium size tight knots, some season checks, medium stain, pitch or pitch pockets, or equivalent characteristics, but not in serious combination.

A type often found in this grade is a piece showing a clear or nearly clear face, with numerous or rather serious imperfections on the back. Another type admissible is a piece containing one defect requiring a cut to eliminate. The remainder of such pieces must be of otherwise high quality.

Sizes Available

As in the case of 1&2 Clear and C Select, D Select is obtainable in 4/4 to 16/4 thicknesses and occasionally in 20/4 and 24/4, either rough or surfaced. It likewise is available in specified or random widths and lengths.

Uses

D Select SUGAR PINE is suitable for manufacture into lower quality interior and exterior trim, and for use in moderate or low cost houses.

It can be used economically for purposes requiring lumber of fairly good quality, as in window casings, cornice work, window and door frames, kitchen and pantry cupboards, shelving and mouldings.

It is used extensively in the making up of patterns and for other foundry or industrial use, both because of its fine working qualities and because it is obtainable in any size desired. It is often attractive to the small millwork factory and other users who have no objection to the admissible small imperfections.

Thick Factory Select (No. 3 Clear)—Sugar Pine

(page 46)

Description

This is the highest grade of factory lumber. It is a cutting-up grade, intended for use by pattern makers, door manufacturers and similar concerns, and is always graded from the poor side. Its value lies in the percentage of clear door cuttings that can be sawn from a plank.

The Western Pine Association Grading Rules require that each piece shall contain at least 70% of clear, door cuttings. This, however, is the minimum and few pieces are found which do not contain a much greater percentage of door cuttings.

While the method of establishing this grade is the computing of the door cuttings to determine the percentage, a large portion of the pieces contain clear cuts which are much larger than those required in the manufacture of doors.

Thick Factory Select (No. 3 Clear) as well as all other grades of Shop lumber should not be confused with yard or finishing stocks as appearance is given little consideration, the percentage of clear cuttings being the determining factor.

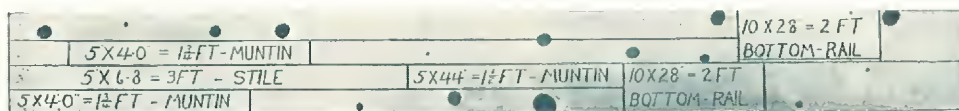
Sizes Available

Thick Factory Select (No. 3 Clear) SUGAR PINE is obtainable in 5/4, 6/4, 8/4, 10/4, 12/4, 16/4, either rough or surfaced.

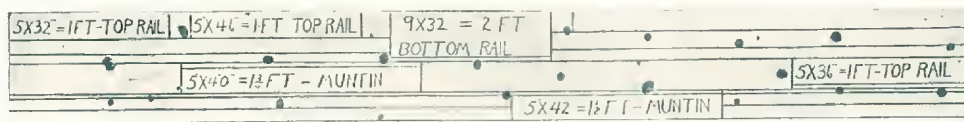
Widths range from 5 inches upwards, with very few pieces less than 10" and most of the stock will usually run 12 inches and wider. An occasional piece may be found less than 10 feet long, but practically all of a shipment will be 10 feet and longer and usually heavy to 16'.

Uses

Thick Factory Select (No. 3 Clear) SUGAR PINE is highly recommended for use in the making of built-up foundry patterns and it is well suited for school manual training work and manufacture into doors and numerous other millwork articles, due both to its fine workability and the fact that this grade produces many large clear cuts with a minimum of waste.



No. 2 Shop—This piece is 20½ inches wide by 16 feet long. It scales 27 feet surface measure and the total footage of acceptable door cuttings is 12 feet, or 44.4%.



No. 3 Shop—This piece is 22 inches wide by 16 feet long, and scales 30 feet surface measure. It contains 29.1% of No. 1 and 2 door cuttings and 33½% of sash cuttings.

No. 1 Shop—Sugar Pine (page 47)

Description

No. 1 Shop SUGAR PINE is the second highest grade of factory lumber and its value is based on the percentage of door cuttings produced.

Each piece must contain from 50% to 70% of door cuttings, and as in Factory Select, these cuttings shall be clear, except that one No. 2 stile is admissible in any one piece, but this No. 2 stile may contain only one small blemish.

Sizes Available

Same as Thick Factory Select (No. 3 Clear).

Uses

No. 1 Shop SUGAR PINE is regarded very highly, both for built-up pattern use and door or millwork articles, because of its fine working qualities, and the large, clear cuts produced.

No. 2 Shop—Sugar Pine (page 48)

Description

Each piece of No. 2 Shop SUGAR PINE produces one of the following percentages of door cuttings: 25% No. 1 Cuttings or 33½% of mixed No. 1 and 2 Cuttings, or 40% No. 2 Cuttings in the same sizes as specified for No. 1 Shop, and including top rails which must be of No. 1 quality but counted as No. 2 Cuttings. Detailed description and sizes of these cuttings are shown in the Association Grading Rules.

Sizes Available

Same as in Thick Factory Select (No. 3 Clear) and No. 1 Shop.

Uses

Large quantities of No. 2 Shop SUGAR PINE are consumed by woodworking plants producing doors, sash, and frames, also by pattern makers and other industrial trade.

No. 3 Shop—Sugar Pine (page 49)

Description

No. 3 Shop SUGAR PINE includes all pieces 5/4 and thicker, below the grade of No. 2 Shop, with the specific provision that such stock must be of a cutting type suitable for sash, door and other cuttings.

Therefore, all pieces showing the greater part of the area of the common board grade type, although having a small percentage of valuable cuttings on the edge or edges, are not considered a cutting type, and not included in this grade.

Sizes Available

The sizes of No. 3 Shop are the same as for the other factory grades as to widths, lengths and thicknesses.

Uses

No. 3 Shop SUGAR PINE is valued chiefly for sash cuttings but this grade is also used extensively for manufacture into frames, sills and jambs.

Inch Factory Select (No. 3 Clear)—Sugar Pine

(page 44)

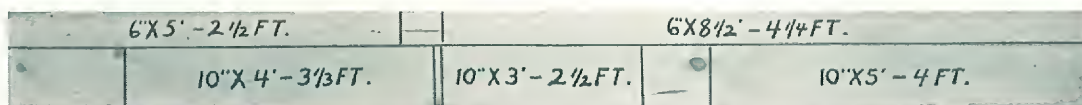
Description

Only two grades of Inch factory lumber are manufactured. Inch Factory Select (No. 3 Clear) is the higher of these two grades and must contain at least 70% of cuttings. These cuttings must be 5 inches wide or wider and three feet long or longer and shall grade C Select or Better on the better face. Cuttings as short as 18 inches are admissible if 9½ inches wide or wider and must be clear on both sides if less than 3 feet long.

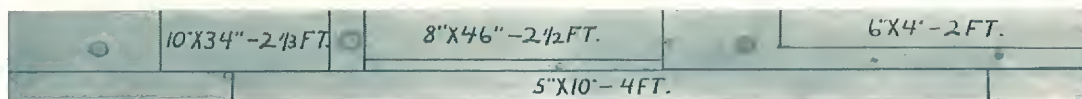
Sizes Available

Inch Factory Select (No. 3 Clear) is invariably shipped 5 inches and wider, random widths and lengths, the greater portion of which usually is 10 inches and wider, and 10' and longer although shorter lengths are admissible.

It is shipped either rough or surfaced and when surfaced may be obtained in either 25/32" or 13/16".



Inch Factory Select (No. 3 Clear)—This piece is 16 inches in width and 14 feet in length, and scales $18\frac{3}{4}$ board feet. It contains 16.6 feet of cuttings, or 88.8%.



Inch Shop—The sample above is 15 inches wide by 14 feet long. It scales $17\frac{1}{2}$ board feet, and contains 10.8 feet of cuttings, or 61.9%.

Uses

Inch Factory Select (No. 3 Clear) SUGAR PINE is used to excellent advantage at cabinet shops, millwork factories, wood specialty plants, school manual training departments and pattern shops for all uses where wide or long clear cuttings are desired with a minimum of waste.

Inch Shop—Sugar Pine (page 45)

Description

Inch Shop SUGAR PINE is graded on the same basis as Inch Factory Select (No. 3 Clear) and requires from 50% to 70% of the same cuttings as specified in Inch Factory Select (No. 3 Clear).

Sizes Available

Same as Inch Factory Select (No. 3 Clear).

Uses

Inch Shop SUGAR PINE is used for practically the same purposes as Inch Factory Select (No. 3 Clear) and can be used in most millwork factories to good advantage with very little waste.

No. 2 & Better Common—Sugar Pine (page 50)

Description

This grade is a combination of the No. 1 and No. 2 Common boards. Although the greater part of a shipment is No. 2, the inclusion of the No. 1 tends to give this grade a fine smooth appearance.

As indicated in the photograph, red knots are, of course, the predominating characteristic, and the quality of these knots is the determining factor in preparing the grade. These will vary in size from one-half inch to two inches in the narrower strips, with an occasional smooth red knot three inches in size as the maximum for a twelve inch board.

Other characteristics are fine season checks, some pitch or small pitch pockets, medium stain, or an occasional small, not firmly set, black knot. No serious combination of these characteristics is admissible, and the grade is prepared in such a manner as to permit each piece to be used full length, for any purpose where a good board is required.

Sizes Available

This grade is available in thicknesses of $4/4$, $5/4$, $6/4$, $8/4$, $10/4$, $12/4$ and $16/4$. Random widths are strong to 12 inches and wider and lengths run heavy to 16 foot.

Uses

It is used extensively for industrial items and is particularly desirable for flat or concealed portions of patterns and for making flasks in foundries. It is also used in building construction, for items like knotty paneling, drop siding, cupboard shelving, barn boards, tanks, cornice and other exterior trim.

No. 3 Common—Sugar Pine (page 51)

Description

No. 3 Common SUGAR PINE constitutes a large part of the total production of lower grade material, and appearance obviously is not so much an attribute in this grade, yet the pieces are fairly smooth looking.

This grade includes pieces having a wide range of characteristics, varying from the piece of otherwise No. 1 or No. 2 quality with a single defect which causes it to grade No. 3, down to pieces showing a number of coarse knots, or boards with loose knots or an occasional piece of otherwise high quality with a small to medium size knot hole.

A limited amount of heart shake, pitch, season checks or stain is admissible, provided that these do not occur in serious combination, and that the piece is of otherwise high quality.

Sizes Available

This grade is available in the same sizes as No. 2 & Btr. Common.

Uses

No. 3 Common SUGAR PINE is used largely for making foundry flasks and for other foundry purposes; also in building construction for store and warehouse shelving, barn boards, concrete forms, sheathing, sub-flooring, roof boards, and to some extent for exterior trim in low cost construction. A considerable amount is used for boxes and crates.



No. 4 Common—Sugar Pine

No. 4 Common SUGAR PINE is used for sheathing, sub-flooring and lining in low-cost construction and for temporary purposes. It is used in the industrial trade for boxes and crates. Some boards are very coarse knotted, waney, badly split or perhaps extremely pitchy. Other types may have worm holes, excessive heart shake, red rot or skips in dressing. It has utility value and is frequently purchased because of the serviceability it offers at low cost.

No. 5 Common—Sugar Pine

No. 5 Common Sugar Pine is the lowest standard grade, practically without grade restrictions but properly edged and trimmed. It is recommended only for temporary uses.

Piece Descriptions of Sugar Pine Grade Photographs

Examples of 1 & 2 Clear Sugar Pine (page 41)

- No. 1. 1x8"-10' Has a light bark pocket at center, no other defects.
 No. 2. 1x8"-10' Appears perfect but has two short threadlike streaks of light pitch.
 No. 3. 1x10"-10' Three feet from one end is a half inch tight knot; the piece is otherwise perfect.
 No. 4. 1x10"-10' A perfect piece.
 No. 5. 1x10"-10' Has a small amount of light stain at one end and a quarter inch pin knot.
 No. 6. 1x12"-10' Face is entirely free from defects, the back has half inch of wane for fifteen inches.
 No. 7. 1x12"-10' Face is perfect, the back has a small streak of medium pitch.
 No. 8. 1x12"-10' Three feet from one end is a quarter inch pin knot and a small spot of stain around the knot.

Examples of C Select Sugar Pine (page 42)

- No. 1. 1x8"-10' **Face.** A streak of light pitch eight inches long. A pin knot at center and a light crossing stain near opposite end.
Back. Shows a half inch knot and considerable pitch for eighteen inches.
 No. 2. 1x8"-10' **Face.** Three feet from one end is a small pin knot. Four feet from other end a small bruise on the edge.
Back. Two three-quarter inch blind knots, one of which has broken up slightly in milling.
 No. 3. 1x10"-10' **Face.** Free of defects.
Back. A light manufacturing mar eight inches long.
 No. 4. 1x10"-10' **Face.** A streak of medium stain one inch wide and three feet long, and a light crossing stain in center.
Back. Two dry pitch pockets, one-eighth inch wide and five inches long.
 No. 5. 1x10"-10' **Face.** Two short streaks of medium pitch.
Back. A three-quarter inch sloughed knot on the edge.
 No. 6. 1x12"-10' **Face.** Very light pitch distributed over half the face and streak of medium pitch one-eighth by two inches.
Back. Slightly more pitch showing.
 No. 7. 1x12"-10' **Face.** Slight indications of bark around one edge of a smooth two-inch curly spot.
Back. Has a one and one-quarter inch blind knot.
 No. 8. 1x12"-10' **Face.** Four pin knots well scattered.
Back. Two pin knots and a half inch of wane for three feet

Examples of D Select Sugar Pine (page 43)

- No. 1. 1x8"-10' **Face.** Three feet from one end on the edge is a dry pitch pocket seab three-eighths by three and one-half inches, four feet from other end a small pitch pocket.
Back. Has four knots, the largest being one inch in size and has two small pitch pockets.
 No. 2. 1x8"-10' **Face.** A streak of medium pitch two inches wide and two feet long at one end, other end has a streak of light pitch one inch wide and four feet long.
 No. 3. 1x10"-10' **Face.** Has two five-eighths inch not firmly set black knots, no other defects.
Back. Same knots and four feet medium stain.
 No. 4. 1x10"-10' **Face.** A pitch pocket one-quarter by four inches.
Back. A streak of heavy pitch two inches wide and three feet long.
 No. 5. 1x10"-10' **Face.** Has a one and one-half inch tight black knot.
Back. Same knot and considerable medium stain.
 No. 6. 1x12"-10' **Face.** Two feet from one end is a one-inch tight black knot and a streak of light pitch running out from the knot.
Back. Same knot and a manufacturing mar a half inch deep and one inch long.
 No. 7. 1x12"-10' **Face.** Six knots well scattered, the largest being five-eighths inch in diameter and also a medium machine burn at one end.
Back. Same knots slightly larger and two small spots of torn grain.
 No. 8. 1x12"-10' **Face.** A streak of rather heavy pitch two inches wide and four feet long.
Back. Same amount of pitch and two small knots.

Examples of Inch Factory Select (No. 3 Clear Sugar Pine (page 44)

- No. 1. 4/4x10"-10' 1 cut 5"x36".
 1 cut 10"x60".
 1 cut 12"x20".
 1 cut 10"x50".
 1 cut 12"x22".
 1 cut 12"x19".
 1 cut 12"x31".
 1 cut 12"x29".
 1 cut 6"x40".
 1 cut 6"x38".
 1 cut 12"x19".
 1 cut 10"x35".
 1 cut 12"x50".
 No. 2. 4/4x12"-10' 1 cut 12"x18" One end.
 1 cut 7"x38" One edge.
 1 cut 7"x42" One edge.
 1 cut 7"x79" Opposite edge.
 1 cut 6"x42" One edge.
 1 cut 5"x57" One edge.
 1 cut 12"x20" Opposite edge.
 1 cut 12"x61" Opposite edge.
 1 cut 8"x36"

Examples of Inch Shop Sugar Pine (page 45)

- No. 1. 4/4x8"-10' 1 cut 8"x78" Clear both sides.
 No. 2. 4/4x10"-10' 1 cut 10"x57" Clear both sides.
 1 cut 6"x36" Clear both sides.
 1 cut 8"x36" Clear both sides.
 1 cut 8"x57" Two very small bark pockets, small patch torn grain.
 No. 3. 4/4x10"-10' 1 cut 13"x22" Clear both sides.
 1 cut 13"x24".
 1 cut 13"x18".
 No. 4. 4/4x12"-10' 1 cut 6"x72" 1 very small bark pocket in center.
 1 cut 11"x41" Clear face, light brown stain over half the back.
 1 cut 11"x32" Clear both sides.
 1 cut 8"x42" Clear both sides.
 1 cut 9"x53" Clear both sides.
 1 cut 10"x20" Clear both sides.
 1 cut 10"x28" Clear both sides.
 1 cut 10"x36" Trace of light pitch streak.
 1 cut 10"x24" Clear both sides.

Examples of Thick Factory Select (No. 3 Clear) Sugar Pine (page 46)

- No. 1. 6/4x10"-10' 2 Stiles 5"x7'6".
 No. 2. 6/4x10"-10' 1 Stile 6"x7'.
 1 Bottom Rail 10"x36".
 1 Stile 5"x6"-10".
 No. 3. 6/4x14"-10' 2 Bottom Rails 9"x36".
 1 Bottom Rail 10"x32" at one end.
 1 Stile 6"x7'6".
 No. 4. 6/4x18"-10' 2 Stiles 5"x7'.
 1 Bottom Rail 10"x28".
 No. 5. 6/4x26"-10' 1 Edge.
 1 Bottom Rail 9"x28".
 1 Bottom Rail 9"x36".
 2 Muntins 5"x4".
 Other Edge.
 2 Stiles 1'6"x7'6".
 1'6"x7'.
 1 Bottom Rail 10"x28".

Examples of No. 1 Shop Sugar Pine (page 47)

- No. 1. 6/4x11'-10' 1 Stile 5"x7'6".
2 Muntins 5"x3'6".
- No. 2. 6/4x14'-10' 1 No. 1 Stile 6"x7".
1 No. 1 Stile 6"x7'6".
- No. 3. 6/4x16'-10' 1 Muntin 6"x4' opposite edge from stile.
1 Stile 6"x7'6" one edge.
1 Bottom Rail 10"x36" opposite edge from stile.
- No. 4. 6/4x18'-10' 1 Stile 6"x7" one edge.
1 Bottom Rail 10"x36" at one end.
1 Bottom Rail 9"x36" opposite edge.
- No. 5. 6/4x26'-10' 1 Bottom Rail 10"x36" }
1 Bottom Rail 10"x36" } One edge.
1 Bottom Rail 10"x36" }
1 Bottom Rail 9"x36" } Center.
1 Bottom Rail 10"x36" }
1 Muntin 6"x3'6" other edge.

Examples of No. 2 Shop Sugar Pine (page 48)

- No. 1. 6/4x10'-10' 1 No. 2 Stile 5"x6'-8".
1 No. 2 Bottom Rail 9"x28".
- No. 2. 6/4x10'-10' 1 No. 1 Stile 5"x7".
2 No. 1 Top Rails 5"x28".
- No. 3. 6/4x10'-10' 1 No. 2 Bottom Rail 10"x28".
1 No. 1 Muntin 6"x48".
- No. 4. 6/4x14'-10' 1 No. 1 Stile 5"x7'-6".
1 No. 1 Bottom Rail 9"x36".
1 No. 2 Bottom Rail 9"x32".
1 No. 2 Bottom Rail 9"x28".
- No. 5. 6/4x18'-10' 1 No. 2 Stile 6"x7'-2".
1 No. 1 Bottom Rail 10"x36".
1 No. 2 Bottom Rail 9"x28".
- No. 6. 6/4x18'-10' 1 No. 1 Stile 5"x6'-8".
1 No. 1 Muntin 6"x48".
1 No. 2 Bottom Rail 9"x36".

Examples of No. 3 Shop Sugar Pine (page 49)

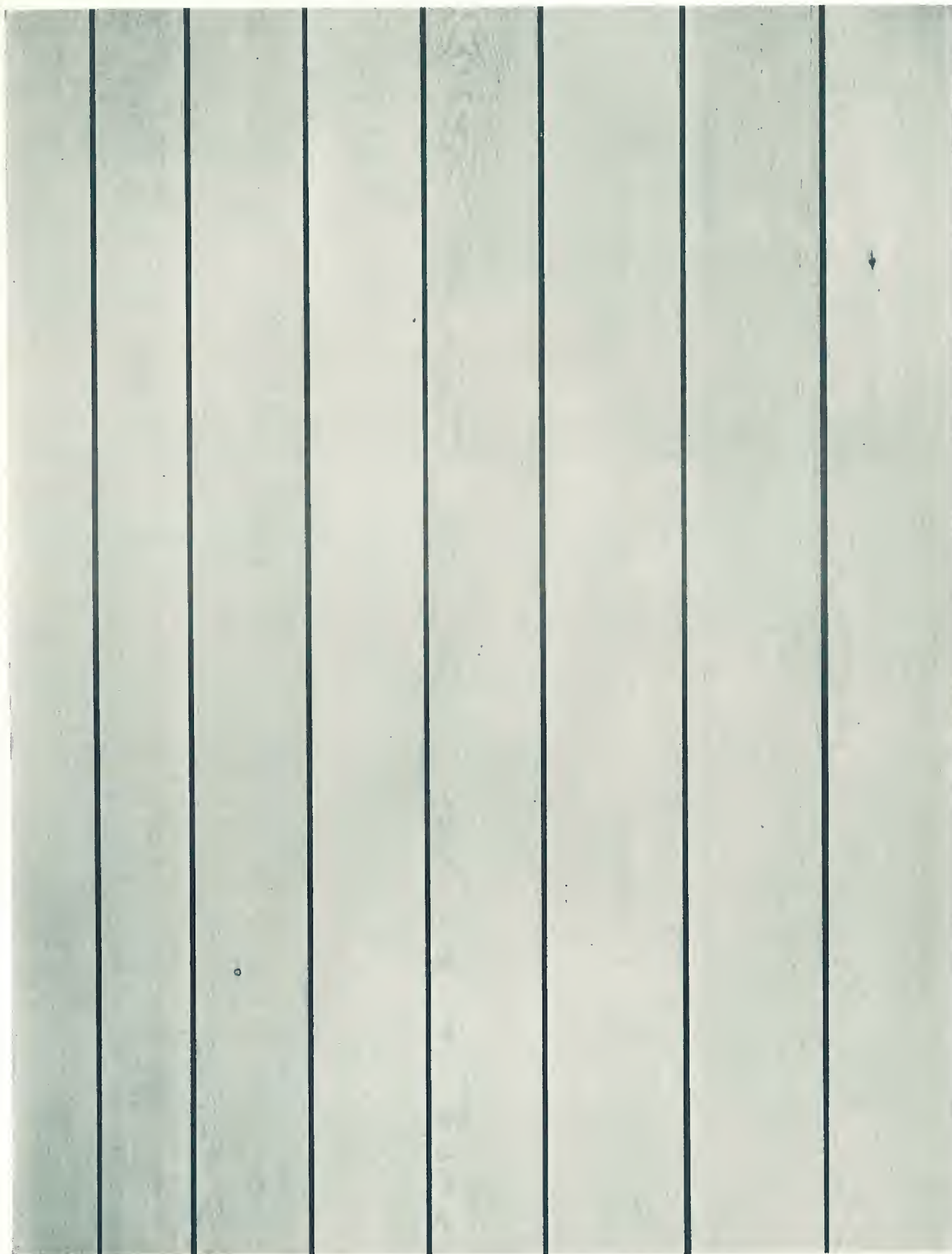
- No. 1. 6/4x10'-10' 1 No. 2 Bottom Rail 9"x32".
5½ lineal feet 4" Sash Stock.
- No. 2. 6/4x9'-10' 5 lineal feet 3" Sash Stock.
1 No. 2 Bottom Rail 9"x32".
15½ lineal feet of 3" & wdr Sash Stock.
- No. 3. 6/4x10'-10' 3 No. 1 Top Rails 6"x28".
7 lineal feet 2½" Sash Stock.
- No. 4. 6/4x16'-10' 1 No. 1 Bottom Rail 10"x28".
2 No. 1 Top Rails 5"x36".
10 lineal feet 4" Sash Stock.
- No. 5. 6/4x18'-10' 1 No. 2 Stile 5"x6'-8".
1 No. 1 Top Rail 5"x36".
9 lineal feet 2½" & wdr. Sash Stock.
- No. 6. 6/4x18'-10' 1 Cut Clear 1 side 8"x7'-6" (suitable for Jamb).
1 No. 1 Top Rail 5"x32".
6 lineal feet 2½" Sash Stock.

Examples of No. 2 & Btr Common Sugar Pine (page 50)

- No. 1. 1x8'-10' 2 black knots ½" in size.
3 red knots ½" in size.
1 black knot ¾" in size.
1 ½" stuff — ¼" deep on face.
Very smooth in appearance.
- No. 2. 1x8'-10' 5 red knots from 1¼" to 1½" with light checked centers.
3 smaller knots from ½" to ¾" all firmly set.
- No. 3. 1x10'-10' Has 12 red knots from ¾" to 1½". The larger knots have checked centers that are slightly chipped out. Has 1 spot of medium torn grain on one edge.
- No. 4. 1x10'-10' 7 red knots from ¾" to 1¼" with one edge knot slightly broken out.
- No. 5. 1x10'-10' 3 red knots from ¾" to 2".
14 smaller knots, both red and black but firmly set.
One of the larger knots slightly broken out in milling, also one of the edge knots chipped out in milling.
- No. 6. 1x12'-10' 8 red knots from ¾" to 2½".
All these knots have checked centers but this board has a very good appearance.
- No. 7. 1x12'-10' Also 3 other smaller knots all firmly set.
Has 15 red knots from ¾" to 1½". Some of the larger knots have checked centers and slightly torn grain around the knots.
- No. 8. 1x14'-10' Has one 2½" red knot with center slightly broken out in milling. Has 13 smaller red knots, also 1½" black knot not firmly set; 1 pitch pocket ½"x2", also one scab pocket on edge ½"x2".

Examples of No. 3 Common Sugar Pine (page 51)

- No. 1. 1x8'-10' A red knot two and one-quarter inches in diameter, and five black knots from three-quarters to one and three-quarters inches in size.
- No. 2. 1x8'-10' One 3½" red knot and seven others from ½" to 1½", in size, also three small streaks of heavy pitch.
- No. 3. 1x10'-10' Has five small red knots and two red knots 3" in diameter, with rather badly broken centers.
- No. 4. 1x10'-10' Five 2" knots, two of these are black but all are tight and smooth.
- No. 5. 1x10'-10' Nine red knots, the two largest being 3" in size, the back has roller checks for a combined length of five feet.
- No. 6. 1x12'-10' Eight black knots from ½" to 1¼" in size, two of them being loose, also three streaks of heavy pitch.
- No. 7. 1x12'-10' Has a three-inch red knot on each edge and fifteen small knots, one of the edge knots has broken slightly in dressing.
- No. 8. 1x12'-10' Ten red and tight black knots 1 inch in diameter, also a 1 inch knot hole.



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SCALE 1 INCH=1 FOOT

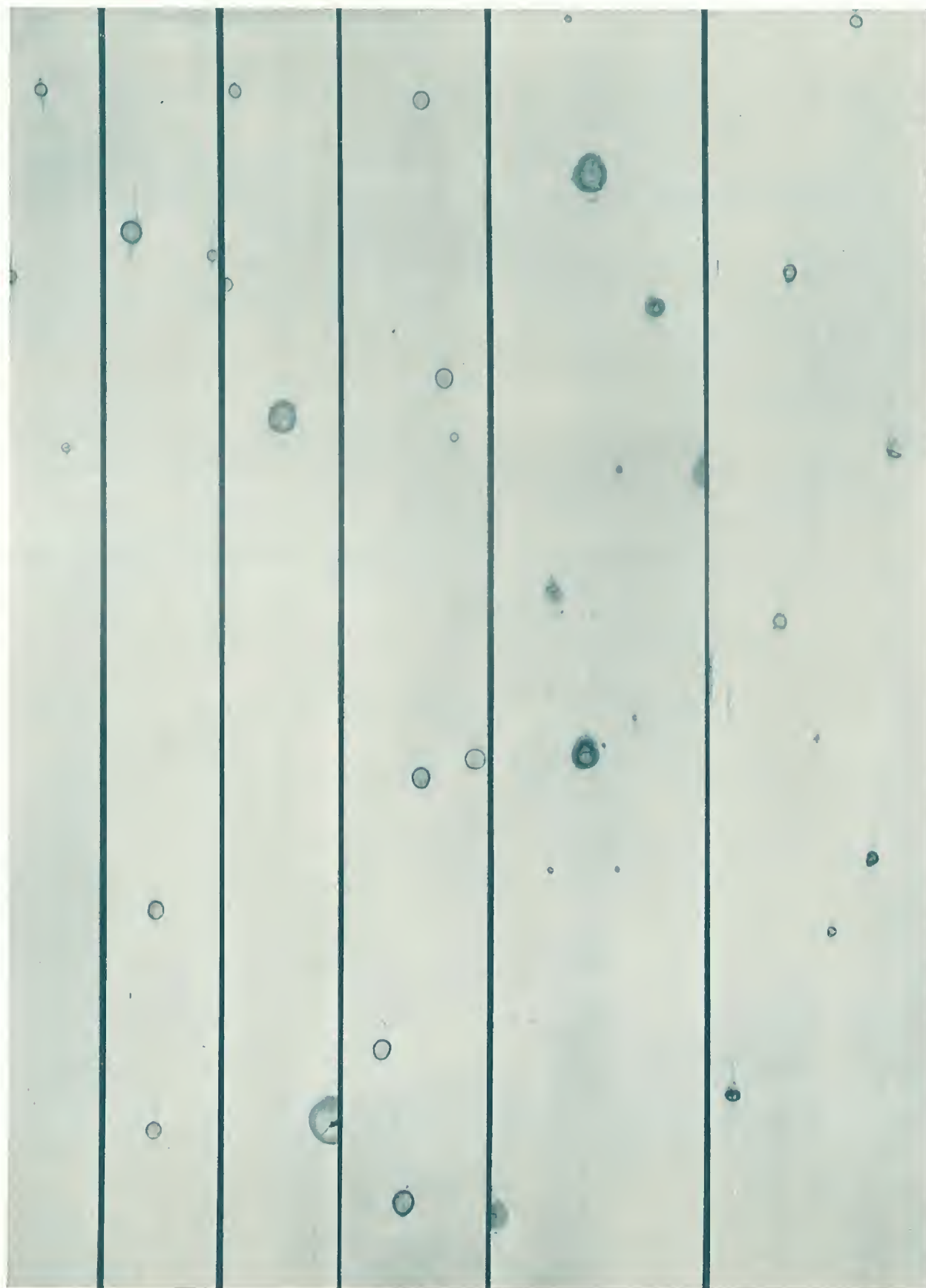
1 & 2 Clear Sugar Pine (Genuine White Pine)
8, 10 and 12-inch Widths



Inch Factory Select (No. 3 Clear) Sugar Pine (Genuine White Pine)

10, 12, 12, 12, 14 and 18-inch Widths

SCALE 1 INCH=1 FOOT



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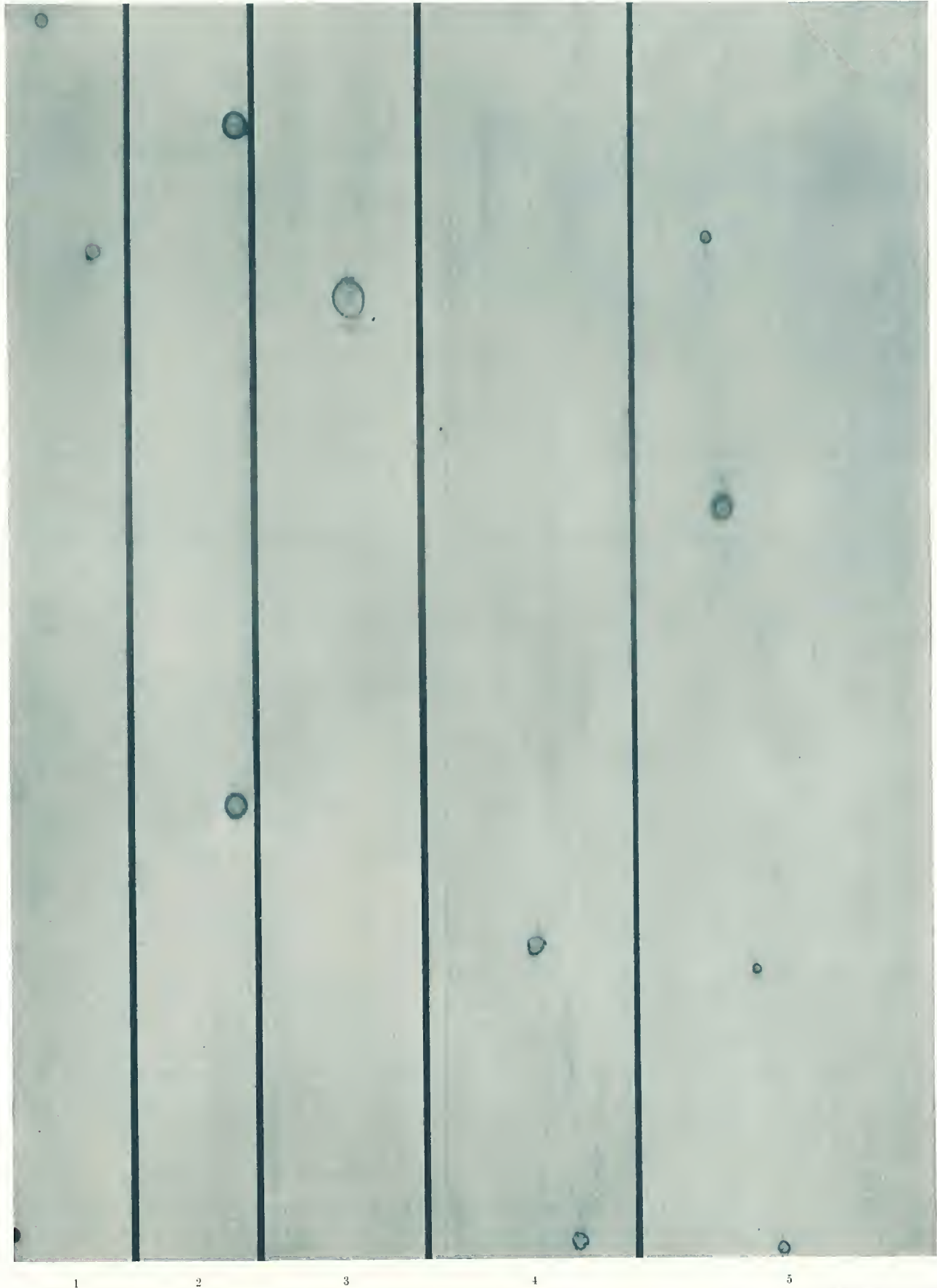
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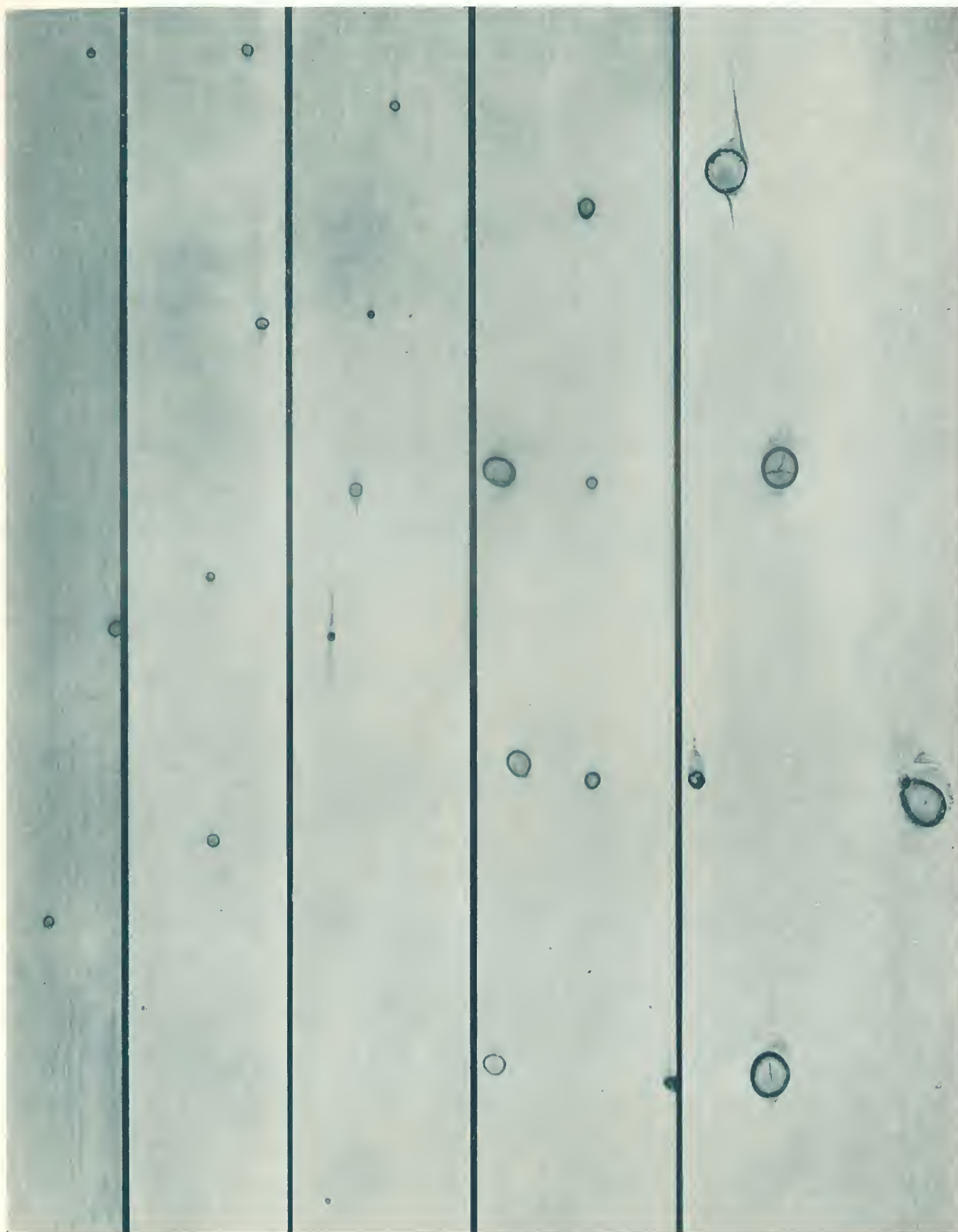
Inch Shop Sugar Pine (Genuine White Pine)
8, 10, 10, 13, 19 and 20-inch Widths

SCALE 1 INCH=1 FOOT



Thick Factory Select (No. 3 Clear) Sugar Pine (Genuine White Pine)
10, 10, 14, 18 and 26-inch Widths

SCALE 1 INCH=1 FOOT



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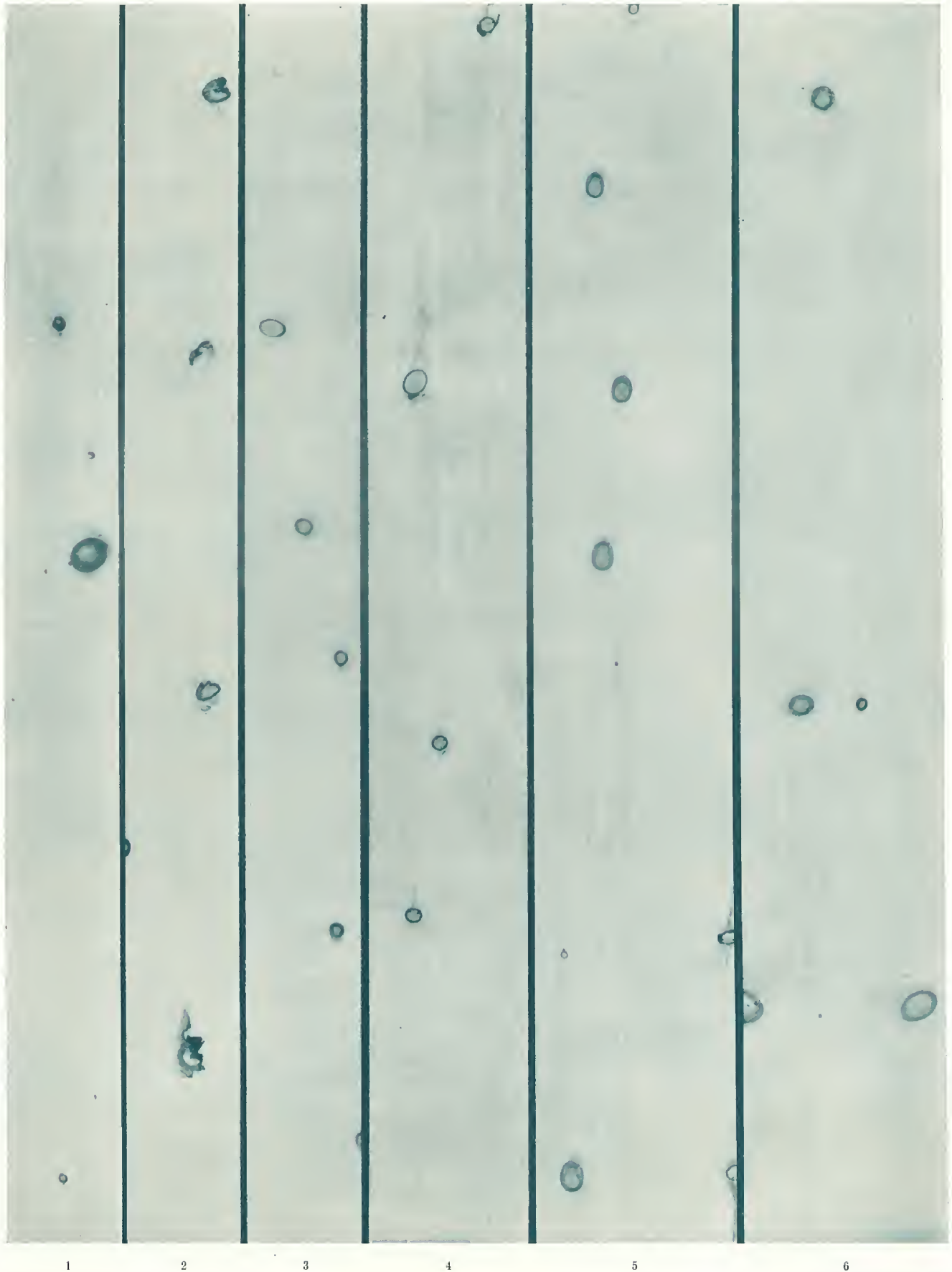
3

4

5

No. 1 Shop Sugar Pine (Genuine White Pine)
10, 14, 16, 18 and 26-inch Widths

SCALE 1 INCH=1 FOOT



No. 2 Shop Sugar Pine (Genuine White Pine)
10, 10, 10, 14, 18 and 18-inch Widths

SCALE 1 INCH=1 FOOT



No. 3 Shop Sugar Pine (Genuine White Pine)
10, 9, 10, 16, 16 and 18-Inch Widths

SCALE 1 INCH=1 FOOT



No. 2 & Btr. Common Sugar Pine (Genuine White Pine)
8, 10, 12 and 14-Inch Widths

SCALE 1 INCH=1 FOOT



No. 3 Common Sugar Pine (Genuine White Pine)
8, 10 and 12-inch Widths

SCALE 1 INCH=1 FOOT



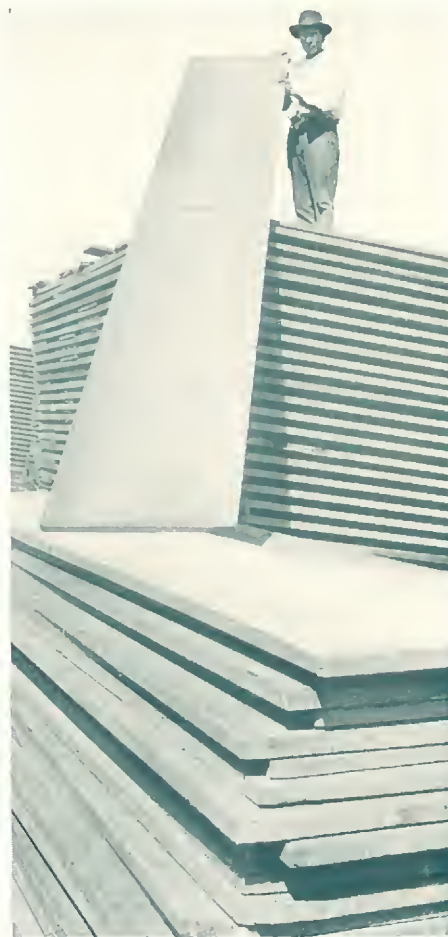
(Left) Sugar Pine sawmill and log pond; (right) interior of mill, showing "head rigs" where the logs are first sawn into lumber.

Distribution of Sugar Pine

SUGAR PINE is sold by retail lumber yards and wholesale distributing yards in most parts of the United States. At many of these yards a good assortment of grades and sizes of this wood are carried in stock; at others, it is ordered from the mills as wanted. Wood fabricating plants use SUGAR PINE for such stock items as window and door frames, screens, windows and doors. The sawmills carry a large supply of SUGAR PINE in all sizes and grades in their storage yards and sheds, thoroughly dried and ready for immediate use. In 1936, SUGAR PINE lumber was shipped into 45 states, and large amounts were exported to the United Kingdom, Canada, South Africa, Australia, South America, Mexico, Cuba, Germany and other foreign countries.

Domestic shipments are forwarded to various distributing centers in relatively short time, and because of this prompt freight service, it is possible for a buyer to secure his requirements from mill stocks without delay. Both mixed car lots and carload orders are handled promptly by the SUGAR PINE mills.

The Western Pine Association will gladly assist any interested party in locating an ample supply of SUGAR PINE, should any difficulty in this direction be encountered. Correspondence should be addressed to the Association offices, Yeon Building, Portland, Oregon.



Wide, thick Clears and many other Sugar Pine items are regularly carried in stock, ready for prompt shipment.

The Western Pine Association, whose producing territory embraces the states of Arizona, California, Colorado, Idaho, Montana, New Mexico, Oregon, South Dakota, Washington, Wyoming and British Columbia, is comprised of 150 lumber manufacturing concerns.

Sales are handled by the individual companies and their agents in the principal distributing centers. A list of the member companies will be furnished on request.



A Genuine White Pine